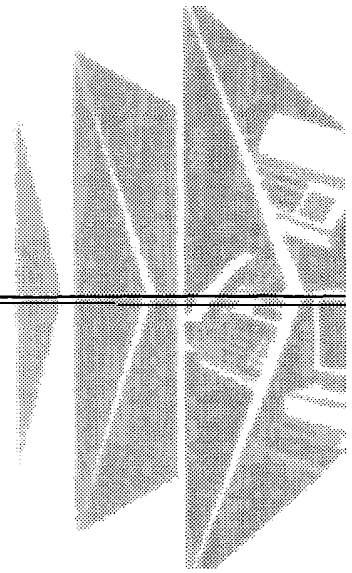
Issue 1 Release 2.0 January 1996

MITEL MAIL™

Voice Processing Solutions

Installation and Service Manual



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About This Manual

This manual describes how to install and service the Series 6 Communications Server, Model 70.

Who Should Read This Manual

This manual is intended for Centigram Certified Technicians (CCTs), responsible for installing and servicing the Model 70 voice mail server.

Technicians must have experience with voice mail servers, PC hardware component installation, and an understanding of basic telecommunications principles. They must have completed the VoiceMemo Phase I and Phase II Installation and Maintenance courses and the Model 70 update training.

If you do not meet these criteria, do not attempt to install or service the Model 70. Please contact your regional office or the Centigram Regional Operations Manager.

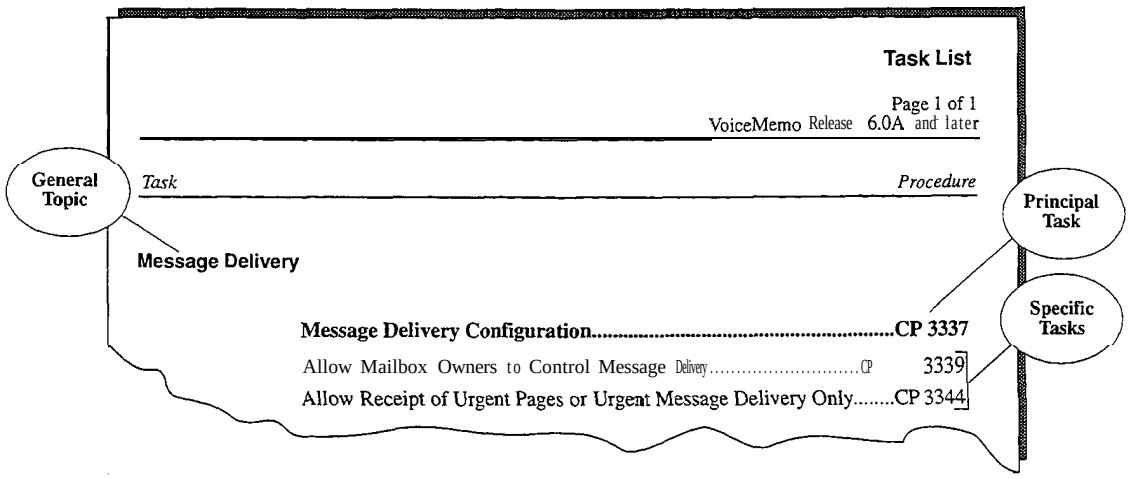
How to Use This Manual

This manual contains reference information, task lists, a collection of procedures for performing those tasks, and reader aids such as menu maps.

Task list



Use the task list, starting with a principal task, to install a new server or service an existing server. Each task is described in more detail in a procedure. For example, if you are installing a new server, look on the task list in the "Installing New Systems" section. The lists are alphabetized rather than sequenced, to help technicians find the desired task (and procedure) quickly. The following example shows how a task list is organized:



Procedures

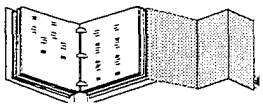


Procedures follow the Task List of each reference chapter. Follow the steps in Centigram Procedures (CPs) to accomplish the desired tasks. The procedures are structured so that technicians can use the CPs as a simple checklist if desired, or as step-by-step instructions.

When necessary, CPs refer you to supplemental information such as additional procedures, other manuals, tables, and menu maps. These references are found in the procedures' reference columns.

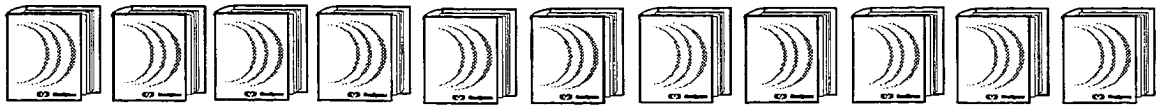
Each CP is numbered for document identification and referencing. Numbering does not indicate a sequence of performance.

Menu Maps and Other Navigation Aids



Most of the documents in the new Centigram document library have menu maps or a "road map" procedure. You can refer to these document navigation aids at any point to help you reach a menu or show you which task to perform next. The List of Centigram Procedures at the back of the manual lists all of the procedures in the manual and tells you where to find them. It also tells you how they are related to each other. And don't overlook the index; it is the fastest way to find all references to a specific topic.

Which Document Do I Use?



Topics listed below are described in the Centigram documents indicated. This table lists documents for the base hardware and software only, not optional features.

Topics	Notice to Installer	System Implementation Guide	Centigram Series 6* Installation and Service Manual	Centigram Series 6 Technical Reference Manual	VoiceMemo Reference and Configuration Manual	Centigram Series 6 Diagnostics Manual
Activating an inactive configuration					✓	
Administration by Phone					✓	
Billing					✓	
Call placement					✓	
Card configuration				✓		
Card replacement			✓			
Defining a line group					✓	
Diagnostics						✓
DID VoiceMemo application					✓	
Disk replacement			✓			
Distribution lists						
Duplicating a configuration					✓	
Error Log messages						✓
Event Recorder messages			✓			✓
FCOSs and feature bits					✓	
Floppy backup and restore			✓			
FPSA					✓	
GCOSs and groups					✓	
Glossary					✓	
Greetings					✓	
Hardware changes	✓		✓			
Hardware descriptions				✓		
Installation procedures	✓		✓			

Topics (continued)	Notice to Installer	System Implementation Guide	Centigram Series 6* Installation and Service Manual	Centigram Series 6 Technical Reference Manual	VoiceMemo Reference and Configuration Manual	Centigram Series 6 Diagnostics Manual
LCOSs and limits					✓	
Mailboxes					✓	
Message delivery					✓	
Message waiting lights					✓	
Paging					✓	
Passcode - mailbox						
Password - console						
Phoneline exceptions					✓	
Power information			✓			
Prompts				✓		
RCOSs (NPA/NXX)		✓		✓		
Release Notes			✓		✓	
Repairing a Centigram Series 6 server	✓					
Replacing a Centigram Series 6 server			✓			
Reports			✓			
Resource Manager					✓	
Service procedures				✓		
Site preparation		✓				
System administration					✓	
System maintenance			✓			
System security					✓	
System verify			✓			
Testing a configuration			✓		✓	
Troubleshooting						✓
Updating	✓		✓			
Upgrading	✓		✓			
Verifying configuration parameters					✓	
VoiceMemo application					✓	

*Includes: Model 70, Model 120, and Model 640 Installation and Service Manuals.

What If Information Is Missing?

If the information you need is not yet available in the documents listed above, go to these documents:

- *Release Notes for VoiceMemo Software Release 6.OA*
- Other existing documents, as applicable

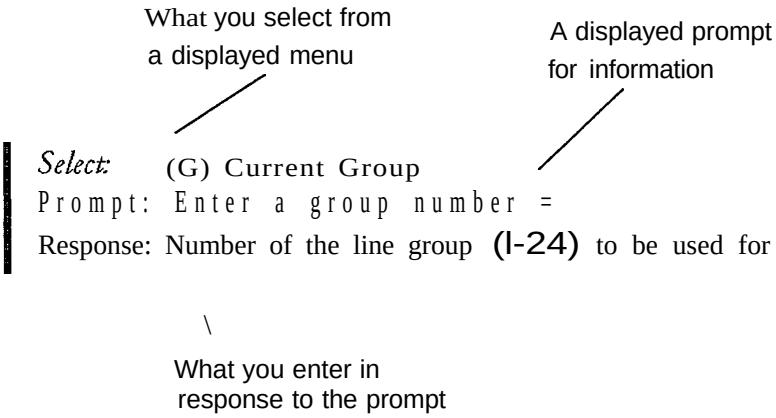
How Do I Obtain the Documents I Need?

To obtain other Centigram documents, contact your local Centigram distributor.

Conventions Used in This Manual

The procedures in this manual use the following conventions to describe how you enter configuration information and how information is displayed on the Series 6 server console:

Press Enter	Press the Enter key. For example, "Press Enter if the current number is correct." On some keyboards, this key is labeled "Return" or has a return arrow (J) on it.
Enter	Type the text shown, then press the Enter key. For example, "Enter the line number (l-24)" means type a number from 1 through 24, and then press the Enter key.
bold	Words or characters in bold type indicate either a value to be entered by you exactly as shown or, when used to indicate a variable entry, describe the type of value to be supplied by you. See example above.



Note: Unless otherwise stated, press Enter after each response you enter.

Reader Advisories

Reader advisories used in this manual are shown below.

Note: Information especially useful in relation to this procedure.



CAUTION!

Information that helps you prevent equipment or software damage.



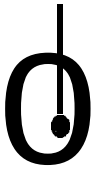
CAUTION!

Information that helps you avoid electrostatic discharge (ESD) damage to the equipment.



WARNING!

Information that helps you prevent an interruption to telecommunications traffic.



WARNING!

A hazard that can cause you personal injury.



DANGER!

Warns of a condition that could severely injure or kill you.

Before You Start

This manual assumes that you are familiar with using a console and keyboard. This section describes how to use the Centigram Series 6 server effectively.

Console lips and Techniques

The tips and techniques offered in the following paragraphs can make configuration entry sessions at the Centigram Series 6 server maintenance console more productive.

Viewing Menus

- When you finish entering a value for a parameter, the server displays an abbreviated form of the current menu, called the "short menu." To view the complete current menu when a short menu is displayed, just press Enter.
- To return to the Main Menu from any VoiceMemo application configuration menu, press X (Exit), until the Main Menu appears.

Accepting Defaults

- To accept a default displayed in a *prompt*, just press Enter.
- To accept a default displayed in a *menu*, no action is necessary.

Avoiding Automatic Exit



CAUTION!

The Centigram Series 6 server "times out" after 15 minutes. This means that if you do not enter anything at the console for 15 minutes, the server automatically exits from the current program. When this happens, all work that has not been saved on the disk is lost.

To avoid being timed out and losing your work, follow these steps:

1. When you need time to think, write down the name of the current menu.
2. Exit to the (server) Main Menu.
3. When you want to continue your work, enter the appropriate menu options to regain your place.

If you find that the Centigram Series 6 server has timed out, follow the steps below. If your screen is blank, press any key to reactivate the screen and then continue with these steps.

1. Press any key to start the login sequence.
2. Enter your user ID and password (if requested).
3. Starting from the Main Menu, enter menu options to proceed to the menu from which the server timed out.
4. Reenter data as needed to regain lost work.

Quitting an Entry Session

At any point during entry of offline or online parameters, you can quit. Quitting discards all parameter entries you have made and leaves the VoiceMemo application configuration the way it was before you starred entering parameters.

To quit from the VoiceMemo Configuration Offline or Online menu:

Select: (Q) Quit -- Forget Changes
Prompt: Quit and forget changes? (y/n) =
Response: Y to return to the VoiceMemo Configuration Main Menu.

Shortcut Commands

You can use the Ctrl (Control) key or the / (slash) key while simultaneously pressing another key to execute shortcut commands at an Centigram Series 6 server maintenance console.

To do this...	Type...
Activate a timed-out console.	any key
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu and save any entries.	**/X**
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu without saving any entries.	**/Q Y**
Stop scrolling a displayed report.	**Ctrl-S**
Resume scrolling a displayed report.	**Ctrl-Q**
Return to the VoiceMemo application when a # or $ prompt is displayed.	**Ctrl-D** *or type* exit

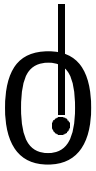
Preparing for Hardware Installation

Before you begin to install any Model 70 hardware, read the following warnings.



WARNING!

An equipment grounding conductor that is not smaller in size than the ungrounded branch-circuit supply conductors must be installed as part of the circuit that supplies the product or system. Bare, covered or insulated grounding conductors are acceptable. Individually covered or insulated equipment grounding conductors must have a continuous outer finish that is either green, or green with one or more yellow strips. The equipment grounding conductor is to be connected to ground at the service equipment.



WARNING!

The attachment plug receptacles in the vicinity of the product or system must be of a grounding type and the equipment grounding conductor serving these receptacles must be connected to earth ground at the service equipment.



DANGER!

Never install telephone wiring during a lighting storm.

Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

Never touch uninsulated telephone wires or terminals unless the telephone lines has been disconnected at the network interface.

Use caution when installing or modifying telephone lines.

Protecting Your Equipment From Damage



CAUTION!

Many of the Model 70 components are easily damaged by electrostatic discharge (ESD) or rough handling: line cards, CPU cards, and hard disks are particularly susceptible to damage. Unless instructed otherwise, observe the precautions listed below and in individual sections during the handling of all components.

If you follow these simple instructions, you will reduce the risk of equipment trouble, down-time, and customer dissatisfaction:

- Wear a grounded wrist strap while handling components. Doing so protects the components from electrostatic discharges (ESD).
- Do an orderly shutdown of your server before turning its power off. Refer to Cl? 6268, “Shut Down a System,” for instructions.
- Removing or installing a component while the server power is on can severely damage both the component and its associated circuitry.

  Always:

  - Wait 60 seconds after your turn the server power off. The hard disk should stop spinning and be quiet.
  - If you need to set switches or jumpers on a circuit card, first place the card on an anti-static mat. If such mat is not readily available, use the card’s anti-static bag as a temporary mat. If neither a mat nor a bag is available, do not work on the component until you have obtained one.
  - Store circuit cards and other components in anti-static bags and their original shipping boxes.

1 Product Description

Introduction

This chapter provides a high level description of the Centigram Series 6 Communications Server Model 70 hardware and software functions, features, and components. It also provides general server specifications.

Expanded discussions of some of the topics in this chapter are found in other chapters of this manual. Additional information is also located in the *VoiceMemo Reference* and *Configuration Manual* and the Centigram *Series 6 Technical Reference Manual.*

Model 70 Overview

The Model 70 is based on a standard desktop PC cabinet featuring seven available ISA slots, a 200-watt AC power supply, a 486-66 MHz CPU, an IDE hard disk, a 3.5-inch floppy disk drive, a special Multi-Vendor Integration Protocol (MVIP) bus, and a modular design for quick and easy component maintenance. This server can accommodate up to seven analog or digital adapter cards with a maximum of 30 ports (24 ports analog/30 ports digital) and up to two 500 MB IDE drives for a maximum redundant speech storage capacity of 55 hours. (Figure l-l shows the Model 70 block diagram.)

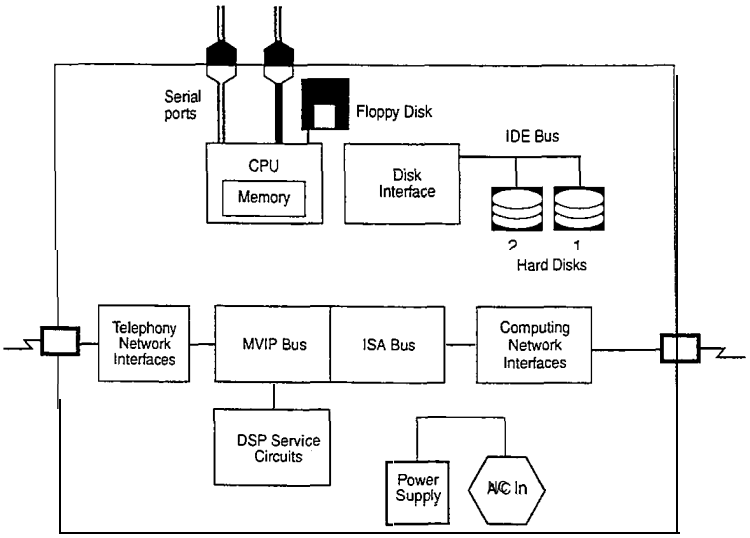


Figure l-1 Model 70 Block Diagram

As the block diagram shows, the Model 70 is a PC-like server containing a CPU, serial port, floppy disk, mass storage, and ISA expansion slots. Three types of ISA adapter cards can be inserted into the expansion slots: telephony interface cards (analog and digital interface cards), telephony service cards (Fax), and computer interface cards (Serial, Ethernet). The telephony interface cards and the telephony service cards can also be linked to the MVIP bus, which is a special ribbon cable linking the adapter cards together and allowing them to share resources.

There are two general categories of mailboxes that are available in the servers at installation: standard (user/owner) mailboxes and special applications mailboxes. All mailboxes can be passcode protected.

Classes of service are assigned to each mailbox. The Features Class of Service (FCOS), Limits Class of Service (LCOS), and Group Class of Service (GCOS) determine what a mailbox owner's options are and how the mailboxes function in relation to one another and the server. The Network Class of Service (NCOS), Restriction Class of Service (RCOS), and Tenant Class of Service (TCOS) are related to optional features.

Standard Model 70 features include voice messaging, audible tone message waiting signals, and notification services. The user interface consists of mnemonic (using letters instead of numbers for commands; for example, "P" to play a message) and single-digit prompts, and an online user tutorial.

The following optional features are also available with the Model 70: FaxMemo, OneView, Cut-Through Paging, CallAgent, MESA Forms, Receptionist II, Auto Wakeup, Integrations, MESA-Net, and AMIS Analog. Additionally, specialty cards can also be installed in the Model 70, such as a Fax card, Smartcard, Ethernet Card, Serial 16/32 card, and others.

You can perform system administration and maintenance tasks either on-site or remotely via telephone. A VT1 00 compatible terminal is required to perform installation and maintenance, and an outboard modem with cables is required for remote administration. (The VT1 00 does not support full screen mode.) In addition to adds and changes, maintenance and restore functions and system reports are available to the system administrator.

Centigram's VoiceMemo Release 6.0 is installed. To provide features, the Model 70 uses QNX , a real-time, multi-tasking operating system to control server resources.

The Model 70 supports the Audio Messaging Interchange Specification (AMIS) standard and can be configured to deliver to mailboxes on other vendors' systems.

Capacities and Expansions

Model 70

Maximum configuration for the Model 70 includes:

- 7 available line/specialty card slots
- VoiceMemo ports (24 analog/30 digital)
- MI55 IDE hard disk - 2,730 mailboxes; 55 hours of message storage @ 18.5Kbps, or 40 hours @ 24 Kbps
- Multiple, redundant hard disks (2 IDE disks maximum)
- User/system prompts in four languages
- Specialty cards: Fax card, Smartcard, Serial 16/32 card, and Ethernet card

Model 70 General Server Specifications

Safety Compliance

This equipment meets or exceeds requirements for safety in the US (UL 1950 1st Edition), Canada (CSA 950), and Europe (TW to EN60950, IEC 950).

FCC Regulatory Compliance

This equipment meets or exceeds requirements for EM1 and telephone interconnectability standards in the US.

Physical Specifications

Height (with feet installed)	6.25 inches (15.92 cm)
Width	16.35 inches (41.65 cm)
Depth	16.50 inches (42.67 cm)
Weight	21 pounds (9.5 kg)

Server Environment

Temperature	Operating: 50 - 95 °F (10 - 35 “C) Nonoperating: 40 - 158 °F (8 - 70 “C)
Humidity	Operating: 85% at 95 °F (35 “C) Nonoperating: 95% at 95 °F (35 “C)
Altitude	Operating: to 10,000 ft (3,000 m) Nonoperating: to 50,000 ft (15,240 m)
BTUs	1700
Noise at operator position	41 dB maximum with peripherals idle
ESD	15 kilovolts
AC power	100 - 120 volts AC, 50 - 60 Hz. 200 Watt 200 - 240 volts AC, 50 - 60 Hz, 200 Watt

Major Hardware Components

The Model 70 consists of a standard desktop PC cabinet featuring seven available ISA slots, two peripheral bays, a 200-watt power supply, a 486-66 MHz CPU, an IDE hard disk, a 3.5-inch floppy disk drive, and a modular design for quick and easy component maintenance. It also features a special Multi-Vendor Integration Protocol (MVIP) ribbon cable bus that connects all line cards, allowing them to switch to any shared resource within the module level. The server backplane can accommodate up to seven analog or digital adapter cards that total between 4 and 30 ports (24 ports analog130 ports digital). Both analog and digital cards can be mixed in the same server. The server also accommodates up to two IDE hard disks for a maximum redundant speech storage capacity of 55 hours. See Figures l-2 through l-4 for details.

All major hardware components are replaceable and are referred to as field replaceable units (FRUs). The Model 70 standard configuration upon shipment includes the following major hardware components:

- Cabinet
- Hard Disk
- Floppy Disk Drive
- Line Cards

A VT100 compatible terminal (administrative console) is required for system administration and installation. For remote administration, an external modem is also required.

Cabinet

The Model 70 is housed in a standard PC cabinet. The housing and its major parts, listed below, are considered one component.

- An ISA-compatible motherboard with a passive backplane, which supports up to seven 16-bit ISA/AT compatible cards (line cards, fax cards, Smartcard, Serial 16/32 card, or an Ethernet card).

- A 200-watt switchable power supply, which provides power for outboard resources, add-in boards, hard disk, and floppy disk drive. The power supply can operate at 120 volts AC or 240 volts AC.

Figure l-2 shows the details of the rear panel. The rear panel includes the following connectors:

- Console Port (Serial Port 1) - provides connection to console

- Serial Port 2 - (RS-232C connector) provides connection to the remote administration/maintenance modem and optional printer
- Parallel Port 1 - not supported
- AC Output Power Connector - provides connection to a peripheral
- Adapter Card Expansion Slots (7) - provide external connection to seven adapter cards . Although there are eight slot openings at the rear panel, the slop opening closest to the power supply has no corresponding connector to the motherboard.
- Keyboard Connector - not supported
- Voltage Switch - selects operating voltage: 120 volt'. (default) or 240 volt
- AC Input Power Connector - provides connection to a +5V/12V power supply provided by user
- Power Supply Fan - provides cooling for the cabinet

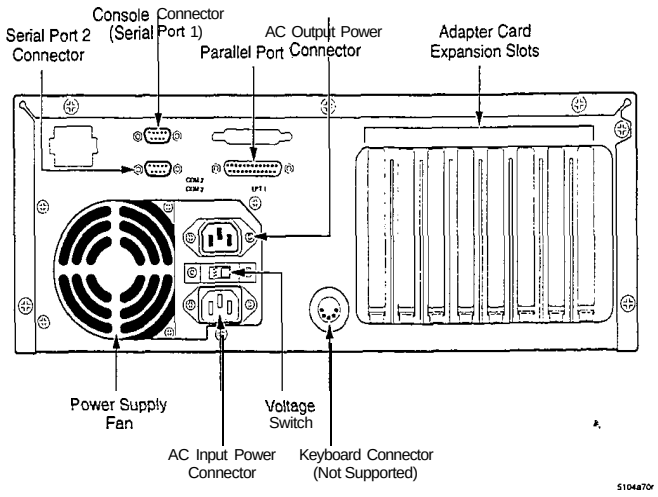


Figure 1-2 Model 70 Rear Panel Connectors

The front panel, shown in Figure 1-3, includes the following controls and indicators:

- HDD LED (Red) - indicates the state of the hard disk and lights when the hard disk is accessed
- Power LED (Green) - indicates the power status and lights when the server power is on
- Bay for 3.5-inch Hard Disk - covered with filter panel and EM1 shield
- 3.5-inch Floppy Disk Drive - used an interface to install, reconfigure, backup, and update the server software
- 3.5-inch Floppy Disk Drive Eject Button - ejects 3.5-inch diskettes
- 3.5-inch Floppy Disk Drive LED (Green) - indicates the state of the floppy disk drive and lights when the floppy drive is accessed
- Power Button- turns the server on and off
- Reset Button - initiates a warm boot, which resets the server without turning off the power supply
- Keyboard Lock - not supported

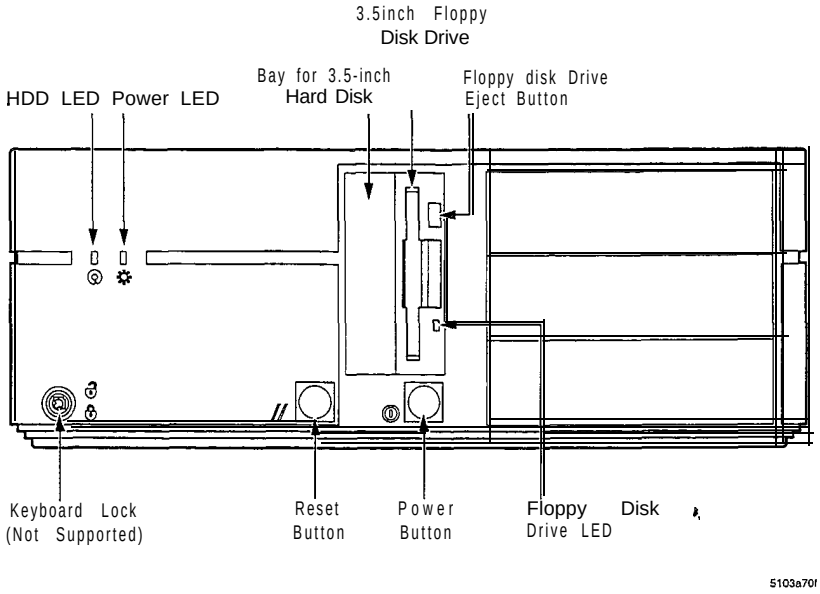


Figure 1-3 Model 70 Front Panel Controls and Indicators

The internal layout of the cabinet is shown in Figure 1-4. It includes the following:

- Expansion Slots - Slots are numbered 0 - 6. Slot 6 is closest to the offboard battery.
- Offboard Battery - for CMOS RAM
- Power Supply
- Bay - Not used
- Front Bezel Assembly - Contains reset button, power on/off button, drive activity lights, power on light and speaker (between bezel and metal chassis)
- Bay and Carrier Disks - Carrier contains hard disk and 3.5-inch floppy disk drive
- Auxiliary Front Fan - and motherboard guides
- Motherboard

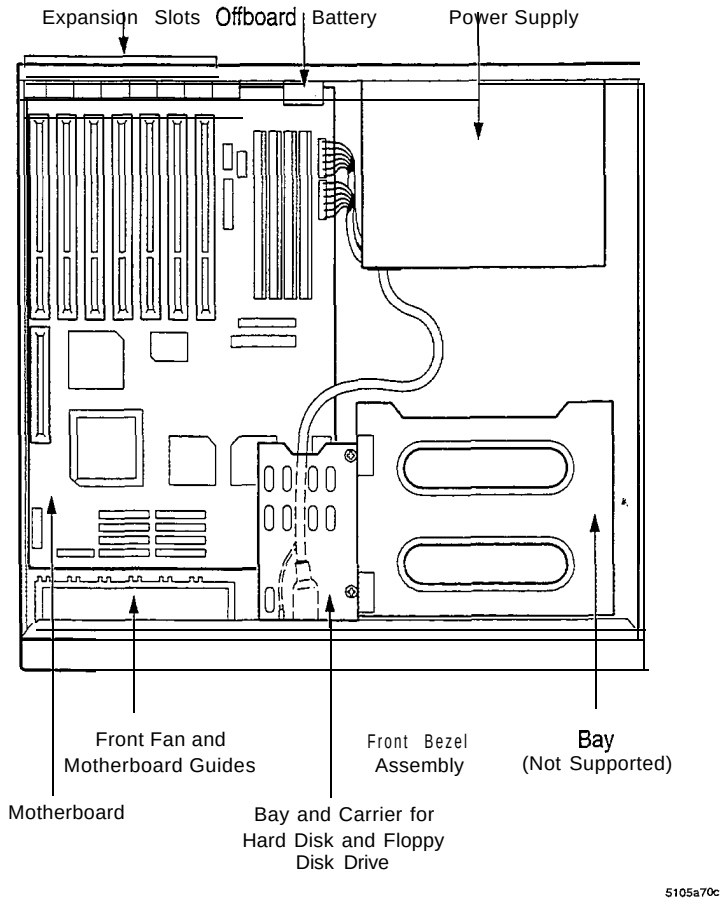


Figure I-4 Model 70 Internal Components

Hard Disk

The Model 70 features a 3.5-inch IDE hard disk (M155) that stores the operating system, speech, names, greetings, prompts, messages, and applications. (For specific hard disk specifications, see the *Centigram Series 6 Technical* Reference *Manual.*) This server can accommodate up to two disks for a maximum of 55 storage hours, with redundancy, at 18.5Kbps.

Floppy Disk Drive

The Model 70 features a 3.5-inch, 1.44 MB floppy disk drive that uses 3.5-inch double sided, double density diskettes. The floppy disk drive is used to install, reconfigure, and update the server software, backup mailbox and account data files, and increase the memory storage capacity of the hard disk.

Line Cards

Line cards are the primary interface between the Model 70 and the telephone network. These cards control all incoming calls, including fax messages. All line cards support the Multi-Vendor Integration Protocol (MVIP), which enables the Series 6 server to interface with a wide range of third-party telephony cards.

Line cards are available in four or eight ports configurations, and are full-size AT cards that plug into empty slots on the Model 70 cabinet's backplane. There are two general types of line cards offered: analog and digital. The analog line cards include (4/8 ports) Loop Start, Ground Start Trunk, Direct Inward Dialing Trunk, and E & M Trunk. The digital cards offered are T1 (24 ports) Loop Start, Ground Start Trunk, Direct Inward Dialing Trunk, and E & M Trunk and El (30 ports) An external -48 volt power supply is also required when using DID, E & M, or Ground Start line cards. For detailed line card information, see the *Centigram* Series 6 *Technical Reference Manual.*

The line cards have the following features:

- Speech digitization (analog-to-digital and digital-to-analog) and compression
- Line signaling and supervision
- DTMF, progress tone detection, and synthesis
- Control and speech buffer memory for each of two channels, and program memory
- Multi-Vendor Integration Protocol (MVIP) support

Specialty Cards

The Model 70 can also accommodate specialty cards that support computer, fax, and LAN services (such as, Fax cards, Smartcards, Ethernet cards, and Serial 16/32 cards).

Fax Card

Fax cards handle incoming fax messages and support other telephone interfaces. When the incoming fax tone is emitted, the fax card performs a "handshake" with the fax machine that is sending the tone and processes the incoming fax. The Fax card sends the fax to the hard disk where it is stored for later retrieval or distribution by the user. For detailed Fax card information, see the Centigram *Series 6* Technical *Reference Manual* and the *VoiceMemo FaxMemo Manual.*

Smartcard

Smartcards provide multiple, simultaneous serial connections required for applications such as PBX integration, host computer communication, and MESA-Net networking. This card is compatible with EIA RS *232-C,* CCITT V.24, and V.28 asynchronous communications standards.

Smartcards feature two, four, or eight ports and are full-size AT cards that plug into empty slots on the Model 70 cabinet's backplane. For detailed Smartcard information, *see* the *Centigram Series 6 Technical Reference Manual* and the *Smartcard Manual.*

Serial 16/32 Card

Serial 16/32 cards are replacement cards for Smartcards that provide faster throughput, such as sixteen channels through an external adapter box. For detailed Serial 16/32 card information, see the *Centigram Series 6 Technical Reference Manual.*

Ethernet Cards

Ethernet cards provide special local area networking capabilities. For detailed Ethernet card information, see the Centigram *Series 6 Technical Reference Manual.*

Major **Software** Components

This section provides an overview of available user and server features and special applications. Depending on your specific server configuration, the Model 70 you are working with will include some or all of the features discussed in this section. Software, including support for some optional features, is loaded in the Model 70 when shipped. Additional hardware is required to implement some optional features.

For more detailed information, refer to the *VoiceMemo Reference and Configuration Manual.*

Series 6 Communication Server

The Model 70 is one of the Series 6 Communication servers. It is a modular, open, standards-based communication server that allows users, to make, send, receive, and answer voice and fax messages from a single mailbox 24 hours a day, using a pushbutton phone. The Model 70 is compatible with virtually every PBX and Central Office Switch.

The server is shipped with VoiceMemo Software Release 6.0. The Series 6 server uses the QNX operating system from QNX Software.

Mailbox User Features

Voice Mail/Messaging

The basic function of the Model 70 is message taking and retrieval. The mailbox user can receive, review, save, delete, and reply to or send messages.

Several delivery options are available to users:

- Marking a message as urgent
- Making a message confidential (so that it cannot be passed on to another user)
- Specifying message delivery dates (future delivery)
- Requesting a return receipt (verification that the message was listened to)

Customization

Users can customize mailboxes. This customization includes greetings, distribution lists, fax delivery, and reminder calls.

Distribution lists

A distribution list allows a mailbox user to send the same message to several other users simultaneously. Mailbox user distribution lists are established over the telephone. Each list is assigned an individual distribution list number.

Two types of lists are available: mailbox user distribution lists, which are accessible only by the mailbox owner; and master, or system distribution lists, which are established by the system administrator and accessible by all users of a line group.

The ability to create, access, or be part of a distribution is determined through class of service assignments.

A distribution list can contain up to 65,535 members. The server allows a maximum of 200 personal distribution lists per mailbox and 200 master lists. Distribution lists can be nested, enabling one list to contain other lists.

Message Waiting

This feature provides a "stutter" dial tone or flashing light indication at the user's phone to signal that a new message has arrived. This audio indication is only available on the telephone number associated with the user mailbox.

Outdial Notification

There are two types of Outdial Notification: Paging and Message Delivery.

Paging notification uses a radio pager to let the mailbox user know in real-time that there is a message waiting. If the pager is a voice pager, the server delivers the first 30 seconds of the voice message. (Message length is dependent on the pager company.) It can also send customized alphanumeric messages.

The user can customize this feature so that the server calls up to two primary and two alternative pager numbers. Notification can be given at specified intervals for all messages or set to notify only when urgent messages are received.

Message Delivery provides notification to a telephone number not associated with a pager. The Model 70 calls the designated telephone number at specified intervals, announce the number of messages waiting for review, and ask the user to log into their mailbox.

Optional Features

CallAgent

CallAgent adds call processing capabilities to your Model 70 while working in conjunction with your VoiceMemo software. It allows you to create automated attendant and call processing applications, letting you control the time, destination and method of each call processing event. CallAgent gives you the option of

arranging the presentation of what callers hear and where callers go within the server. It can be programmed or changed over the telephone using simple menu-driven pushbutton commands.

Auto Wakeup

The server allows the mailbox user to schedule wakeup or reminder calls. These calls can be scheduled for and made from the server any time, any day and anywhere. Each call can be directed to a specific telephone number and can occur multiple times at specified intervals.

Cut-Through Paging

Cut-Through paging sends the actual call-back number rather than the mailbox number to the mailbox user's pager.

FaxMemo

The FaxMemo application includes Fax Mail, Fax Broadcast, Guaranteed Fax, Fax Publishing, and Walkaway Fax.. These applications allow users to send, receive, answer, voice annotate, and distribute fax messages. It also provides automatic and/or scheduled delivery via facsimile (download to any fax machine). The FaxMemo software is supplied with the Model 70. The FaxMemo card must be purchased separately for the feature to work.

Special Pager Terminal Protocol Paging

Special pager terminal protocol paging customizes outdial notification to interact with pager systems (TNPP protocol) used by hospitals and other organizations with private, or highly specialized, pager networks.

Receptionist II

With this feature, the server answers incoming phone calls and asks callers to enter the extension number or name of the party they wish to call. Once the information has been entered, the server transfers callers to the desired extension.

Outside Caller Features

All outside caller features can be enabled/disabled from the server console. Callers who leave messages can:

- Replay and rerecord their messages
- Make their messages urgent, placing them in front of the normal message queue
- Leave messages in additional mailboxes on the server

- Be transferred to the operaror or any other extension on the switch

System Features

Distribution lists (also see Mailbox User Features)

A distribution list allows a mailbox user to send the same message to several other users simultaneously. Mailbox user distribution lists are established over the telephone. Each list is assigned an individual distribution list number.

integrations

Integrations establish the connection between the telephone switch and the Model 70. They provide call information for direct and forwarded calls and message waiting signals for the user. Integrations are transparent to both users and callers.

In-band DTMF integration is standard and allows the switching system and Model 70 to communicate by exchanging tones in the voice frequency band.

Optional System Features

AMIS Analog

AMIS Analog is a system networking application that enables the Model 70 to communicate with other vendors' voice processing systems.

OneView

OneView is a multimedia desktop messaging program that works with the Centigram VoiceMemo and FaxMemo applications. It allows you to send and receive fax messages on your PC, and to exchange messages using your current E-mail application by launching it from within OneView. It also allows you to view all your voice and fax messages at a glance, prioritize them, and send and receive messages that combine voice mail and faxes.

Functional System Partition Administration (FPSA)

This feature adds a much higher level of security to Series 6 server administration for both Customer Premise Equipment (CPE) customers and service providers. FPSA is particularly useful to telephone companies, service providers, and large CPE customers who want to limit access to operations, administration, and maintenance (OA & M) functions on a departmental or individual basis. In addition, FPSA offloads or resells certain administrative functions to restricted groups within your organizations or within your customer base. FPSA adds security in five ways. First, it can be activated only by a special diskette, which will be shipped upon request. Second, FPSA controls access to all parts of the server (administration menus or QNX) by passwords and user ID's. Third, you can control who has access to batch commands. Fourth, superusers can force system administrators to change their

passcodes every number of days. Fifth, FPSA provides an audit trail (if the audit trail is turned on) every time an administrator enters the server.

Automated or Video Dispatch

This feature enables you to establish mailboxes with specialized distribution lists for dispatchers and field service representatives. Dispatched message activity can be displayed on a terminal. This application is used by customers with dispatch operations units to increase productivity and reduce dispatch costs.

Call Detail Recorder (CDR)

CDR tracks server activity for billing purposes. It records call information, such as number of messages received, faxes delivered, and outdial notifications, on a mailbox or system level. CDR enables you to bill mailbox users, cost centers, or specific accounts directly.

Configurable Data link and Electronic Set Emulation Integrations

Direct Data Link enables the Model 70 to use a separate data communications circuit to receive call processing information from the PBX or CO. With Electronic Set Emulation, the Model 70 acts as an electronic telephone set to the PBX. Both are optional integration features.

Foreign language Prompts

The Model 70 plays all prompts in a maximum of four languages. Some of the available languages are English, French, French hotel, Spanish, German, Portuguese, Japanese, and Korean.

MESA-Net

MESA-Net is a digital networking application that enables up to 1500 remotely located Series 6 servers to communicate with each other over 16 simultaneously operating digital links. (Some of the 1500 remote Series 6 servers must be shared if Administered AMIS is also being used.)

Classes of Service

Classes of service define the features and capabilities of mailboxes. Six distinct classes of service categories can be programmed and assigned independently of one another. Classes of service can be used in combination to build multiple tiers of service offerings or privileges. More information about classes of service can be found in the *VoiceMemo Reference and Configuration Manual.*

Feature Class of Service (FCOS)

An FCOS determines what voice mail capabilities a mailbox user has and how each call is processed. Each feature is called a feature bit. Over 200 features bits are available. The server allows a maximum of 640 FCOSs, or combinations of features. Each mailbox must be assigned an FCOS.

limits Class of Service (LCOS)

The LCOS defines all of the time and storage parameters of a mailbox by restricting message, greeting, and outdialing digit lengths. This class of service is used to control server resources. Up to 640 LCOSs can be programmed to quantify different categories of parameters. Each mailbox must be assigned an LCOS.

Group Class of Service (GCOS)

The GCOS defines the number of users any particular user can exchange messages with. This class of service provides software partitioning at the mailbox level, without requiring partitioning at the line group level.

Two types of groups can be configured: flexible, or bitmapped, GCOS, which allows multiple groups to exchange messages; and closed, or affinity, GCOS, which restricts message exchange to within the defined group of users.

Up to 64 bitmapped GCOSs and 32,000 affinity GCOSs can be assigned in the Model 70. Each mailbox must be assigned a GCOS.

Network Class of Service (NCOS)

The NCOS works in conjunction with the MESA-Net digital networking feature. It is used to assign a user's access and priority on a network that is set up to connect multiple Series 6 servers.

Restriction Class of Service (RCOS)

The RCOS is a parameter assigned to mailboxes that limits what telephone number can be outdialed. Limits are placed on the area codes or exchanges a mailbox can outdial.

Tenant Class of Service (TCOS)

The TCOS is a mailbox option used with the SMDI integration. This feature governs mailbox interaction between user communities.

Special Application Mailboxes

You can configure special application mailboxes in the Model 70. Two special application mailboxes are already preconfigured in the software, the administrator and attendant mailboxes. You can create combinations of special application mailboxes for special purposes. You can find more information about special mailboxes in the *VoiceMemo Reference and Configuration Manual.*

Administrator

The Administrator's mailbox is included in the preconfigured software installation. It belongs to the system administrator and has unique special privileges. These privileges allow you to perform mailbox adds, changes, and deletes by telephone; create master or system distribution lists; and record the company or system greeting.

Attendant

The Attendant mailbox is also included in the preconfigured software installation. This mailbox contains the "message of the day" greeting and a customized user tutorial. It is also the mailbox that receives all unaddressed messages (where neither an extension number nor a user name is entered by the caller).

Broadcast

Broadcast mailboxes allow both users and outside callers to record and send a single message to multiple mailboxes. Voice and fax messages can be sent via the Broadcast mailbox. Distribution lists are configured by either the system administrator or the user. Each broadcast mailbox can send messages to up to 65,535 members.

Chain

Chain mailboxes allow callers to enter either the desired extension number, or the name of the mailbox owner or mailbox number. Once the information has been entered, callers are transferred to the appropriate mailbox or extension.

Greeting Only

Greeting Only mailboxes are used to provide information to callers, but do not allow callers to leave a message. There are three types of greeting only mailboxes: voice greeting, fax greeting, or voice and fax greeting.

Guest

A Guest mailbox is assigned on a temporary basis. It does not require an owner name or passcode for access. This mailbox cannot save messages.

Rotational

Rotational mailboxes allow constantly changing greetings, either by time and day (period rotation) or with every call (index rotation).

Tree

Tree mailboxes route calls to preselected mailboxes when callers enter a single digit. Callers hear a greeting which gives instructions on which single digit to enter to reach the desired destination. Tree mailboxes can be configured to process callers with rotary dialers.

Shared Extensions is a type of Tree mailbox which allows more than one individual or telephone number to access the same mailbox. Discrete passcodes are assigned to each partition within the mailbox to provide privacy for the sharing users.

Optional Special Application Mailboxes

Guaranteed Fax

A Guaranteed Fax mailbox is associated with the FaxMemo optional feature and creates a "never busy" fax machine. If the fax machine is busy, the call can be forwarded to the Guaranteed Fax mailbox, which will receive the fax. Once received, the mailbox attempts delivery to the fax machine until it gets through. The operation is transparent to the fax sender.

Fax Publishing

With fax publishing, mailboxes can be configured to supplement prerecorded outgoing messages with related hardcopy documents, such as product or company information. This feature provides a convenient way to disseminate frequently requested information to employees, customers, and outside callers.

Fax Store and Forward

This feature enables users to store and forward fax messages the same basic way they store and forward voice messages. Fax Store and Forward provides an efficient way to store important faxes and relay them to other related parties.

MESA Forms

MESA Forms is a template, or voice forms, application. It allows callers to leave messages in a way that simulates written information on paper forms, such as questionnaires, requests for information, or schedules.

2 Installing New Systems

How To Use This Chapter

This chapter provides step-by-step procedures for installing a new Model 70. Additional information is also located in the *VoiceMemo Reference and Configuration Manual, Centigram Series 6 Technical Reference Manual,* and the *System* Implementation Guide.

A task list and Centigram Procedures (CPs) describing new server installations are located at the end of this chapter. The task list identifies two procedural levels of CPs: a high-level CP and a low-level Cl?. A high-level CP provides instructions on how to do overall tasks, such as installing a server. A low-level CP provides instructions on more specific tasks, such as how to install a line card.

Readers familiar with Centigram servers can use the CPs as a checklist if desired, while readers new to Centigram servers can use CPs for step-by-step instructions. After gaining experience with this documentation, you can find your own innovative way of using the task list. One possible approach on how to use the task list is provided below:

Using the Task list



Select from the task list the title of the task that you want to perform and note its high-level CP number. Flip through the CPs in this chapter until you find the correct CP number. Follow the instructions given in the CP.

A reference column in each CP contains pointers, when necessary, to supplemental information such as another procedure, a technical reference in the Centigram *Series 6 Technical Reference Manual,* another manual, or menu maps. Use the tabs included with this binder to find referenced supplemental information that is located within this manual.

If you need to interrupt a CP and seek reference information, first mark the CP with your bookmark or otherwise note down where you are in the CP. After you are finished with the reference information, return to the CP and continue to execute the steps where you left off.

Site Selection and Preparation

The Model 70 is designed to work in a typical commercial environment. Physical space requirements are nominal. The following information describes general site selection and preparation details. For detailed information, refer to the *System* Implementation *Guide.*

Choose a site that is:

- Located near a grounded, three-pronged power outlet (for the United States and Canada, this means a NEMA 5-15R outlet for 100-120 volt AC or a NEMA 6-15R outlet for 200-240 volt AC; for any other regions, please refer to the electrical codes of that region). Noise and surge protection is required.
- Clean and dust free
- Well ventilated and away from heat sources, including direct sunlight
- At least three feet from strong electromagnetic fields produced by electrical devices (such as air conditioners, large fans, electric motors, radio and TV transmitters, and high-frequency security devices)

Before You Start

1. Set up an equipment log to record server model and serial numbers, the server configuration and options found on the worksheets provided to you by your system design engineer, and other information about the server you might find helpful.

2. Check the power supply setting. The 200-watt power supply is integrated into the server to provide power for all resources, drives, cards, and peripherals. A switch on the back panel is used to set the power supply to operate at 115 volts AC (in the range of 100-120 volts AC; 6 amps maximum current) or 230 volts AC (in the range of 200-240 volts AC; 4 amps maximum current). The switch is set at the factory for 115 volt AC operation. To verify that your server has the correct setting, check the input power selection switch on the rear chassis. See Figure 2-l for details.

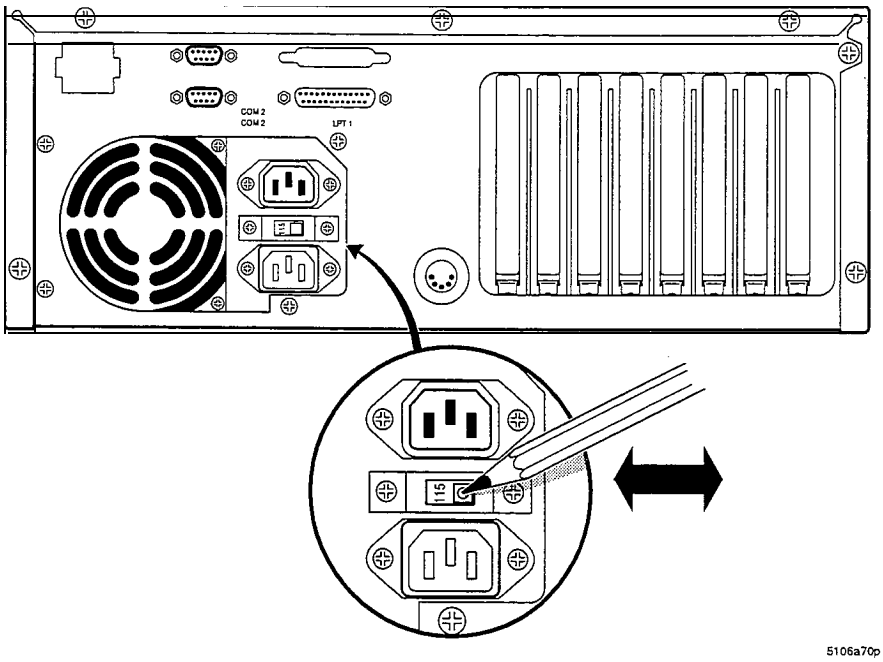
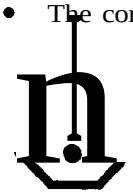


Figure 2-1 Power Supply Setting

3. Check the power cord. In some cases, the power cord supplied with the Model 70 might not be compatible with the type of AC wall outlet in your region. If your power cord is incompatible, you must obtain a suitable power cord that meets the following criteria:

- The cord must be rated for use at the AC voltage available, with a current rating that is at least 125 percent of the current product rating.
- The connector at the end of the cord that plugs into the AC wall outlet must be a grounding-type male plug and must show certification by an agency acceptable in your region.
- The connector at the product end must be an IEC type CEE-22 female connector.
- The cord must be less than 14.8 feet (4.5 meters) long.



WARNING!

Do not attempt to modify or use the supplied AC power cord if it is not the exact type required.



WARNING!

Do not attempt to install or remove any components or peripherals while the Model 70 cover is removed when the server is turned on. Hazardous voltage, current, and energy levels are present in this product.

4. You need a Phillips screwdriver (#2 bit) and a medium flat-bladed screwdriver. You should use an anti-static wrist strap and a conductive foam pad when working on the server.



CAUTION!

Electrostatic discharge (ESD) can damage hard disks, boards and other components. Wearing an anti-static wrist strap attached to a metal part of the server chassis will reduce risk significantly.

5. Be sure to do each procedure in the correct order

Installing the **Model** 70

Each Model 70 is shipped preconfigured per specific customer order (all hardware and software loaded). Regardless of configuration, the base server is shipped with the components listed below. (Additional components might be needed, depending on specific country requirements.)

- Model 70
- Modem
- Modem Cable
- Power Cable

Figure 2-2 illustrates the server components and basic installation procedure. To install the Model 70, follow the steps shown in the Centigram Procedures (Cl's) listed in the Task List at the end of this section.

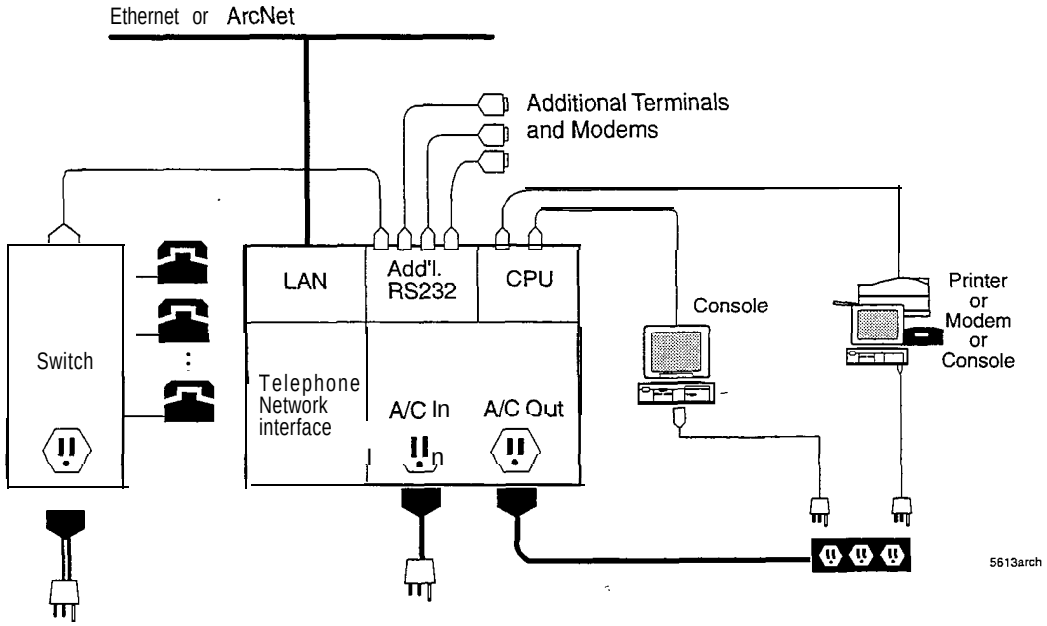


Figure 2-2 Model 70 Components

Customer Turnover

After you have completed the post installation audit checklist as described in the System *Implementation Guide*, turn the account over to the group responsible for ongoing maintenance and support.

Provide the customer with appropriate telephone numbers and escalation procedures. Discuss outstanding items to be completed, review special applications, and communicate areas of concern.

Installation Task list

VoiceMemo Release 6.0A and later

Task	*Procedure*

Installing New Systems

Model 70 Installation	**CP 6590**
Check Installation Quality	Cl? 6258
Connect the Telephone Lines	CP 626 1
Install Console..	CP 62 16
Install Modem	CP 6270
Install Printer	CP 6215
Install Redundant Hard Disk	CP 6284
Run a System Information Report	CP 1340
Run Verify With System Online	CP 7001
Test Basic Telephony Functions..	CP 6201

Note: Procedures for building the customer database are in the *VoiceMemo Reference and Configuration Manual.*

For additional information, refer to the Centigram Series 6 *Technical Reference Manual,* and the *System Implementation Guide.* For detailed information about optional features, refer to the respective optional feature manual.

Updates to procedures and the Model 70 are issued to the field in Centigram's Notices to Installers. You should add them to this guide, as appropriate.

Run a System Information Report

VoiceMemo Release 6.0A and later

This procedure describes how to run a System Information Report. The System Information report shows all the levels of software previously loaded in the server; the type of floppy disk drive installed; the hard disk serial number(s); and the number of system hours, ports, and links in the server. To run additional reports, refer to the *VoiceMemo Reference and Configuration Manual.*

FOR THE MODEL 120 AND MODEL 70 **ONLY:** Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks.

Step	*Reference*
1. Reach the Reports Menu.	Menu Map 9

2. Run the System Information report.

Select: (I) System Information
Prompt: REPORT OUTPUT ROUTING

```
(C) Console (screen)
(P) Console with pause
(1) Printer A
(F) File...
(A) Append to file...
(X) Exit (no report)

If you need help later, type ?.

COMMAND  (C/P/1/F/A/X):
```

Response: *C* to send the report to the console without pausing
P to send the report to the console, pausing as the screen fills,
1 to send the report to printer A*,
F to send the report to a file on the Series 6 server,
A to append the report to an existing file on the Series 6 server, or
X to exit report output options (no report).

* You can have one or more serial ports on your server with different devices, depending on the configuration of your server.

The server displays the report to the output device you select. If you are sending it to the console, use the following commands to control scrolling:

To stop scrolling: Press **Ctrl-S**
To restart scrolling: Press **Ctrl-Q**

Step	*Reference*

1 The following is a sample System Information Report.

```
                    SYSTEM INFORMATION
                  Fri Apr 28 14:55:52 1995

VoiceMemo SERVICE Release 6.00 Rev A17.01 Tue Apr 25 12:56:46 1995

        Partion Table
        1 3 - - - - - - -
        1 3 - - - - - - -
        - - - - - - - - -
        - - - - - - - - -

        Serial number for hard disk is 1234
        Serial number for hard disk is 1234
        System hours : 240
        Hour Lock : 0
        Port Lock : 0
        Link Lock : 8
        UI Lock : 0
        Floppy Type : 1.44M
        OneView session licenses: 100
OneView client licenses: 300
```

Figure 1 Sample System Information Report

Test Basic Telephony Functions

VoiceMemo Release 6.0A and later

This procedure explains how to test basic telephony functions in a newly installed Model 70.

Step | *Reference*

Test Telephone lines

1. Set up your equipment as shown in Figure 1.
2. Use the telephone test set to verify the following parameters:
   - Ringing voltage or proper E & M Signalling
   - End-to-end transmission of voice
   - End-to-end transmission of DTMF
   - Sound quality of lines (no noise or static)
   - Hunting capability of hunt lines

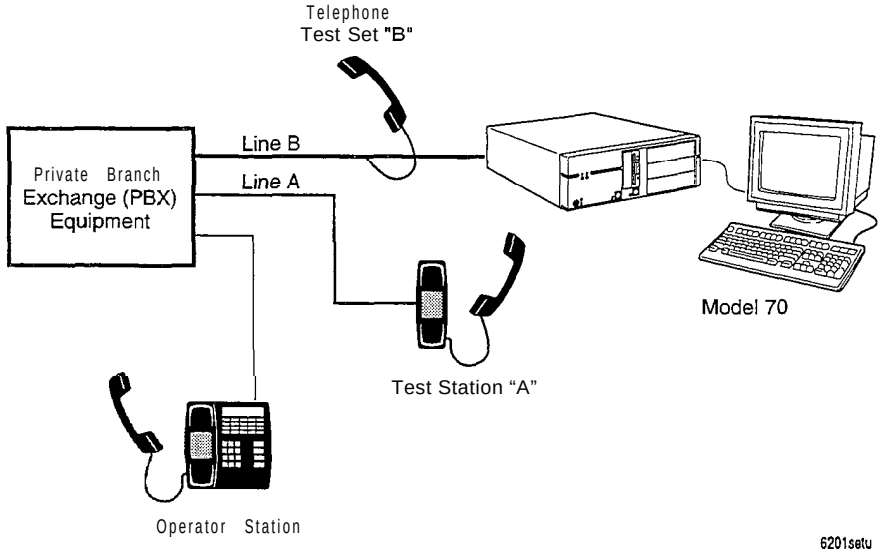


Figure 1 Post-Installation Test-Equipment Setup

Test Answering Capabilities

3. Plug a working telephone (Test Set "B") into an Model 70 port.
4. Call on Test Telephone "A," and ensure that the Model 70 answers with the appropriate greeting. If a port does not answer, see Table 1 for frequent problems and where to go for more details.
5. Repeat the above steps for each additional port.

Step *Reference*

Note: This test cannot be done on installations with full PBX integration where each port is linked to the telephone extension through software. In such installations, plug in all telephone lines, then call each individually. See the test plan provided with the integration software package for full details.

Table 1 Frequent Problems and Reference Documents

Possible Problem	Reference Document
Line card jumpers: Loop/E & M settings	Technical Specification in the "Replacing FRUs" chapter
Line card jumpers: addressing	Technical Specification in the "Replacing FRUs" chapter
Line card: not seating properly	CP 6220 in Chapter 4
Line group programming	*VoiceMemo Reference and Configuration Manual*

Step	Reference
Check Accuracy of Voice Prompts	
6. Create two mailboxes on the system console, using Unlimited Feature Class of Service, and the default Limits Class of Service.	*VoiceMemo Reference and Configuration Manual*
7. Disable the tutorial on the second mailbox.	
8. Call the first mailbox from the test telephone and go through the tutorial. Then:	
a. Press TUV 8 for User Options and listen for the User Options Menu.	
b. Make a message for the second mailbox.	
c. Press WXY 9 twice, in quick succession, to exit the mailbox and return to the Company greeting.	
9. Enter the number of the second mailbox. Then:	
a. Listen for "You have an unplayed message..." Do not respond. After time-out, the Model 70 should play the entire menu: "Press P to Play the current message..."	
b. Play the message. Listen for the prompts to keep, discard, answer, etc.	
c. Press ABC 2 to answer the message. Listen for the prompt to record additional comments.	
d. Press WXY 9 to exit the mailbox.	
10. If while doing the above steps, a prompt is missing, do a Prompts Update using the Service Diskette. When asked if you want to clear the prompts, do so by typing "Clear." Then, insert the prompts diskette and reload the prompts.	CP 6262, Ch. 5
Verify Mailbox Dialing Plan	
11. Set up a dialing plan for the server.	*VoiceMemo Reference and Configuration Manual*
12. Set up one test mailbox for each leading digit of the dialing plan that you are using.	
13. Call the server and enter the number of the first mailbox. Repeat for additional mailboxes. If the server refuses to accept a valid number, check your mailbox dialing plan programming for the port group.	

Step	*Reference*

14. Attempt to enter an invalid mailbox number for each dialing plan position. The server should respond: "That is not a valid mailbox number. Please enter another mailbox number." If a prompt is missing, do an Update using the Service diskette. When asked if you want to clear the prompts, do so by typing "Clear." Then, insert the prompts diskette and reload the prompts.

Test Call Attendant Operation

15. Attach a telephone test set to Line B (Figure 1).

16. Call Line B from Test Station A. You should hear ringing on the test set.

17. Test each of the four attendant access routes that apply to your server. When the dial string to reach the attendant is invoked, listen to the call progress on the test set. Stay on the line at Station A until you are transferred to the attendant.

18. If while doing the above steps the call fails, do the following:

    a. Check the programming of the Call Attendant string (take two 2500 sets and transfer one to the operator). The programming sequence should be identical to the manual transfer operation.

    b. Check the switch hook flash timing of your server's phoneline exceptions: long times cause an immediate disconnect when the server issues a switch hook flash; too short, the caller is not placed on hold.

    c. Repeat the test, this time inserting a plus (+) after the dialed telephone number -many PBXs do not transfer properly if the hangup occurs too fast.

Test Message Indicators

19. Create a mailbox and assign it the correct FCOS to enable the Caller's Menu.

VoiceMemo Reference and Configuration Manual

20. Call the mailbox and leave a message. Your message should complete under each of the following conditions:

    a. You stop speaking and the server hears three seconds of dial tone

    b. You enter a valid DTMF tone

    c. The server "hears" five seconds of dial tone

    d. You reach the maximum message length allowed by the mailbox LCOS

    Note: The message waiting indicator should activate.

21. Log into the mailbox and retrieve the message. Log out. The message waiting indicator should go out.

Step	Reference
Test Feature Classes of Service (FCOS)	
22. Create mailboxes with different FCOS.	*VoiceMemo Reference and Configuration Manual*
23. Test all features assigned to each FCOS. Be sure that appropriate prompts are played and all server responses are correct.	
24. If while doing the above steps you find a problem, check the FCOS programming. Pay particular attention to possible feature conflicts.	
Test limit Classes of Service (LCOS)	
25. Create several mailboxes and assign each a different LCOS.	*VoiceMemo Reference* and *Configuration Manual*
26. Test mailboxes to ensure parameters are correct.	
Test Group Classes of Service (GCOS)	
27. Create several mailboxes with different GCOS.	*VoiceMemo Reference and Configuration Manual*
28. Make messages among mailboxes.	
29. Verify that you can deliver only messages allowed by each mailbox GCOS.	

Install Printer

VoiceMemo Release 6.0A and later

The Model 70 supports one DCE serial printer using X-On/X-Off data transmission protocols. This procedure explains how to attach this printer to the Model 70 and provides configuration guidelines. For detailed printer specifcations, refer to the *Centigram Series 6 Technical Reference Manual.*

Step *Reference*

Verify Electronic Specifications

1. Verify that the customer's printer meets the specifications given in Table 1 below.

Table 1 Printer Specifications

Parameter	Requirement
Baud Rate	9600 baud
Auto Line Feed	Disabled
Line Mode	Full Duplex
Parity	None
Data Bits	8
Stop Bits	1
Data Protocol	X-On/X-Off

Verify Cabling Specifications

2. Obtain the correct RS-232 cable for your printer. Table 2 lists all signals present at the serial port connectors.

Note: The Model 70 is shipped with a 9-pin D-type female console cable which connects to the serial port. The other end of this console cable is a 25-pin D-type female connector. To connect to a terminal, personal computer, modem, or printer, you need an RS-232 cable with a 25-pin D-type male connector at one end of the console cable. The other end of the RS-232 cable will vary depending on the make and manufacturer of the device you are connecting to.

Step *Reference*

Table 2 Printer Pin Assignments

Model 70 (9-pin)	Printer (25-pin)	Signal Name
Pin 1	Pin 4, Pin 5	Carrier Detect
Pin 2	Pin 20	Data Set Ready
Pin 3	Pin 2	Receive Data
Pin 4	Pin 8	Request to Send
Pin 5'	Pin 3	Transmit Data
Pin 6	Pin 8	Clear to Send
Pin 7	Pin 6	Data Terminal Ready
Pin 8	No connection	Ring Indicate
Pin 9	Pin 7	Signal Ground

Connect Printer

3. Connect the 9-pin cable connector to Serial port 2 (designated "S2" in Model 70 software).
4. Connect the 25-pin cable connector to the printer.
5. Test printer as recommended by the manufacturer's documentation.

Install Console

VoiceMemo Release 6.0A and later

This procedure tells you how to connect the console to the Model 70. It also provides switch settings for the most popular terminals that are compatible with the Model 70. For detailed console specifications, refer to the Centigram Series *6 Technical Reference Manual.*

The Model 70 can support a console equipped with a keyboard and a CRT or printer display. You need a terminal to perform administrative and service operations.

Note: You can find TRs referenced in this procedure in the Centigram *Series 6 Technical Reference Manual.*

Step *Reference*

Verify Electronic Specifications

I. Verify that the customer's terminal meets the specifications given in Table 1 below.

Table 1 Terminal Specifications

Parameter	Requirement
Baud Rate	9600 baud (default)
Auto Scroll	Enable
Auto Line Feed	Disabled
Line Mode	Full Duplex
Parity	None
Data Bits	8
Stop Bits	1
Data Protocol	X-On/X-Off

Step *Reference*

Verify Cabling Specifications

2. Obtain the correct RS-232 cable for your terminal. Table 2 lists all signals present at the serial port connectors.

Note: The Model 70 is shipped with a 9-pin D-type female console cable which connects to the serial port. The other end of this console cable is a 25-pin D-type female connector. To connect to a terminal, personal computer, modem, or printer, you need an RS-232 cable with a 25-pin D-type male connector at one end of the console cable. The other end of the RS-232 cable will vary depending on the make and manufacturer of the device you are connecting to.

Table 2 Terminal Pin Assignments

Model 70 (9-pin)	Terminal (25-pin)	Signal Name
Pin 1	Pin 4, Pin 5	Carrier Detect
Pin 2	Pin 20	Data Set Ready
Pin 3	Pin 2	Receive Data
Pin 4	Pin 8	Request to Send
Pin 5	Pin 3	Transmit Data
Pin 6	Pin 8	Clear to Send
Pin 7	Pin 6	Data Terminal Ready
Pin 8	No connection	Ring Indicate
Pin 9	Pin 7	Signal Ground

Step | *Reference*

Verify Terminal Compatibility

3. Make sure that the customer's terminal is one of the VT100-compatible terminals listed in Tables 3 through 7, and set switches appropriately.

   If the terminal is not listed in one of the following tables and it is VT100-compatible, consult the terminal's documentation or TR 1928 in the Centigram *Series 6 Technical Reference Manual* to determine switch settings. — TR 1928

Table 3 Zenith Z-19

Switch (S401)	Setting
1, 2, 7, 8	Down
3, 4, 5, 6	Up
Note: Switches are located inside the cover.	

Table 4 ADDS Viewpoint

Parameter	Parameter
Note: Switches are located at the left side of keyboard.	
Bit 8 = 0	Keyboard = Lower
Parity = 0	Linewrap = On
Stop Bits = 1	Interface = RS-232C
Data Bits = 7	Echo = FDX
Parity = Odd or Even	Speed = 300 baud
Note: Switches are located inside the unit.	
SP/ADV = ADV	Power = 60 Hz
Case = Lower	Lines/Screen = 24
Keyboard Lock = Disable	Cursor Control = Enable
Clear Screen = Disable	Local = On
Protocols 103,202 = Off	Code = Off
Ext = Off	EOT = Off

Step *Reference*

Table 5 **TI** Silent 703

Switch	Setting
Note: Switches are located inside the cover latch.	
1, 3, 4	Left (Open)
2	Right
Note: Switches are located on the upper right corner.	
Upper Case	OFF
On Line	ON
Local copy	OFF

Table 6 **DECwriter** IV

Switch	Setting
Note: Switches are located inside the top cover.	
1, 2, 7, 8	Down
3, 4, 5, 6	Up
Note: Set front panel switch to 300 baud.	

Step *Reference*

Table 7 LSI ADM-3A

Parameter	Parameter
Bit 8 = 0	Keyboard = Lower
Parity = Off	Linewrap = On
Stop Bits = 1	Interface = RS-232C
Data Bits = 8	Echo = FDX
Parity = Odd or Even	Speed = 300 baud
Note: Switches are located inside the unit.	
SP/ADV = ADV	Power = 60 Hz
Case = Upper or Lower	Lines/Screen = 24
Keyboard Lock = Disable	Cursor Control = Enable
Clear Screen =Enable	Local = On
Protocols 103, 202 = Off	Code = Off
Ext = Off	EOT = Off

Connect the Console

4. Connect the 9-pin cable connector to Serial port 1 (designated "S 1" in the VoiceMemo software).
5. Connect the 25-pin cable connector to the terminal.
6. Connect keyboard according to manufacturer's documentation.
7. Test printer as recommended by the manufacturer's documentation.

Check Installation Quality

VoiceMemo Release 6.0A and later

By following the steps below, you will be able to catch and correct all mistakes made during the installation of the hardware. Most checks are visual and require only a few minutes to complete.

Step	Reference
Inspect Installation Quality	
1. Check all internal cables and connectors to make sure that they are tight.	
2. Check all peripheral cable connections to make sure they are properly labeled and easily identifiable.	
3. Check grounding.	
4. Begin building customer data base.	*VoiceMemo Reference and Configuration Manual*

Connect the Telephone Lines

VoiceMemo Release 6.0A and later

This procedure provides guidelines on how to connect Model 120 or Model 70 ports to the buildings main distribution frame (MDF). Consult Appendix A of your *System Implementation Guide* before using this procedure.



WARNING!

Work closely with your project manager to prevent accidental interruption to your telephone services.

Step	*Reference*

Use Correct Jacks

1. The ports on the Model 120 or Model 70 line cards have RJ-45 modular jacks for telephone line connections. Install the telephone lines that go to the Model 120 or Model 70 ports in the RJ-45 jacks.
2. To connect the telephone lines to the corresponding Model 120 or Model 70 ports, use non-inverting (four-wire) telephone cables, with RJ-45 modular connectors on each end. Observe Installation Restrictions.
3. The jacks should be within ten feet of the Model 120 or Model 70.

Protect Your Equipment

4. Protect the ports of the Model 120 or Model 70 line cards from power surges (for example, those caused by lightning or power lines falling on aerial cables). Install carbon-type or gas-type protectors on unprotected lines coming in from the central office or an unprotected PBX. Install protectors as close as possible to where the phone lines enter the building.

Step	Reference

Connect Telephone Lines

5. Ask you project manager where the MDF is situated. The MDF is usually situated in a closet or storage room of the building.
6. Have the worksheets available that show the Model 120 or Model 70 line groups you plan to configure. Make a list of the telephone numbers and their corresponding Model 120 or Model 70 ports.
7. Mount the necessary number of RJ-45 modular connector blocks near the Model 120 or Model 70.
8. Install standard 24-gauge twisted pair telephone wire between the MDF punchdown blocks and the RJ-45 modular connector blocks. If E & M signaling leads are used, a second pair is needed for each modular connector block.
9. Connect each pair to the terminals on the MDF punchdown block. If you want to maintain Tip & Ring integrity, connect the Tip above the Ring connection on the punchdown block.
10. Connect each twisted pair to the RJ-45 modular block.
11. Label the modular blocks to identify which telephone lines are connected to which block. Also indicate in your labeling which Model 120 or Model 70 port each line accesses.
12. Install telephone cables from the modular blocks to the corresponding Model 120 or Model 70 ports.

Install Modem

VoiceMemo Release 6.0A and later

This procedure explains how to connect a modem to the Model 120 or Model 70.

Step *Reference*

Verify Cabling Specifications

1. Obtain the correct RS-232 cable for your modem. Table 2 lists all signals present at the serial port connectors.

Note: The Model 120 is shipped with a 9-pin D-type female console cable which connects to serial port 2. The other end of this console cable is a 25-pin D-type female connector. To connect to a terminal, personal computer, modem, or printer, you need an RS-232 cable with a 25-pin D-type male connector at one end of the console cable. The other end of the RS-232 cable varies depending on the make and manufacturer of the device you are connecting to.

Table 2 Modem Pin Assignments

Model 120 Side (9-Pin)	Modem Side (25-Pin)	Signal Name
Pin 1	Pin 4, Pin 5	Carrier Detect
Pin 2	Pin 2	*Receive Data*
Pin 3	Pin 3	*Transmit Data*
Pin 4	Pin 6	Data Terminal Ready
Pin 5	Pin 7	Signal Ground
Pin 6	Pin 20	*Data Set Ready*
Pin 7	Pin 8	*Request To Send*
Pin 8	Pin 8	Clear To Send
Pin 9	No Connection	Ring Indicate

Step	*Reference*
Connect Modem	
2. Connect the 9-pin cable connector to Serial port 2 (designated "S2" in the VoiceMemo software).	
3. Connect the 25-pin cable connector to the modem. Configure the modem software in the Console/Serial Port Setup option in the System Maintenance - Additional Options Menu.	
4. Test modem as recommended by the manufacturer's documentation.	

Install Redundant Hard Disk

VoiceMemo Release 6.0A and later

This procedure describes how to install a redundant hard disk in the Centigram Series 6 Model *70*.



DANGER!

Disconnect the system from its power source before connecting cables, components, or both.



CAUTION!

Protect your system from ESD damage during handling of all components.

Note: You can find TRs referenced in this procedure in the Centigram Series 6 *Technical Reference* Manual.

Step	*Reference*

Observe Precautions

1. Put on a grounded wrist strap and attach the other end to the cabinet. Doing so protects the component from electrostatic discharge.
2. Shut down the system and turn off the power, if you have not already done so.



CAUTION!

Removing a component while the power is on can severely damage the component you are working on and other peripherals.

3. Wait one minute after you turn off the power before you remove any components. The hard disk should stop spinning and be quiet.
4. When removing a component, place it on a nonconductive surface, such as an anti-static bag. Make sure you have the anti-static bags before you begin.
5. Put identification tags on all cables and disconnect cables from the system.

Step *Reference*

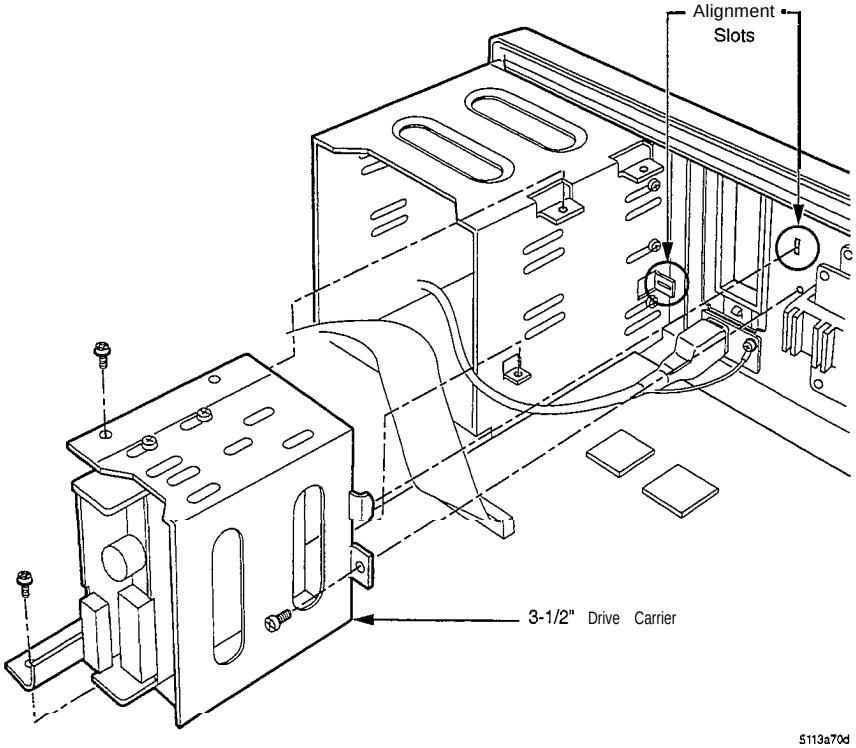
Remove the Disk Carrier



WARNING!

When the disk carrier is removed from the system, the power switch terminals are accessible. These terminals can have hazardous voltages present even when the power switch is turned off. Unplug the system before performing the procedure. Failure to do so can result in personal injury and/or equipment damage.

6. 'Remove cabinet cover. CP 6224
7. Disconnect the data and power cables from both the hard disk and the floppy disk drive.
8. Remove the four screws that secure the carrier to the chassis (6-32 hex head Phillips screws). See Figure 1 for details.
7. Slide the carrier toward the back of the system, freeing the left front tab from the slot on the side of the adjacent drive bay. Make sure all the cabling is clear, and lift the carrier up and out of the system. See Figure 1 for details.



Step	*Reference*
Install the Redundant Hard Disk	
10. Remove the plastic faceplate cover from the top slot in the front of the empty hard disk cage located next to the floppy disk drive.	
11. Remove the aluminum faceplate cover from the top slot of the empty hard disk cage	
12. Jumper the redundant hard disk as a slave (redundant) drive. If there are two hard disks in one server, one must be configured as master and the other must be configured as slave. Hard disks are shipped from Centigram configured as master.	TR 1923
13. Slide the redundant hard disk into the top slot of the hard disk cage. Use the screws that were holding the aluminum faceplate cover to secure the disk in position. Ensure that the hard disk faceplate is flush with the front of the Model 70 cover.	
14. Connect the spare data and power cables to the redundant hard disk.	
Install the Disk Carrier	
15. Position the carrier above the cabinet. The front of the floppy disk drive faces the front of the cabinet and should line up with the opening in the front panel.	
16. Lower the carrier into the cabinet, lining up the front tab on the carrier with the slot that projects from the side of the 5.25inch bay.	
17. Slide the carrier toward the front until the left front tab and the screw holes line up.	
18. Secure the carrier into the cabinet using four mounting screws (6-32 hex head Phillips screws).	
Note: If the floppy disk drive needs to be properly aligned with the front bezel, loosen the mounting screws holding it to the carrier by at most one-quarter turn. Adjust the position as needed. Once the floppy disk drive is aligned, tighten the two screws again.	
19. Reconnect the data and power cables to the hard disk and floppy disk drive.	
20. Reinstall the cabinet cover.	Cl? 6224

Model 70 Installation

VoiceMemo Release 6.0A and later

The Model 70 is preconfigured from the factory and ready to use. This procedure provides guidelines on how to install the server. When using Centigram Procedures (CPs) referenced in this or any other procedures, disregard all instructions that apply to other Series 6 server models.



WARNING!

Observe all equipment safety and ESD precautions detailed in this manual.



DANGER!

To prevent injury either to yourself or others, follow QSHA safety recommendations when lifting equipment.

Note: You can find TRs referenced in this procedure in the *Centigram Series 6 Technical* Reference Manual.

Step	*Reference*
1. Make sure the site is ready (as specified in the "Installing New Systems" section of this manual).	
2. Place the Model 70 near an unused 20-amp AC outlet and away from sources of heat and magnetism. Make sure that the installation area is properly ventilated.	



WARNING!

Make sure the Model 70 power is off.

3. Connect the module to a *dedicated* 20-amp AC wall plug (U.S). For international installation, a 220 volt power supply is required.	
Note: When connecting to a 220 volt power supply, be sure the rear panel voltage switch is set to 220 volts prior to connection.	
4. Ground the cabinet of the module according to Centigram recommendations and the standards set by your organization.	TR 1900
5. If installing a printer, connect it to Serial port 2 and test it as recommended by the manufacturer's user manual.	CP 6215
6. Connect the console to the Console port, or Serial port 1, (VT100 compatible terminal and keyboard) and leave its power switch off.	CP 6216
7. If you do not have worksheets with you, contact your project manager to determine how the customer wants the Model 70 lines configured.	
8. Connect the telephone lines.	CP 6261
9. Turn on the console.	

Step	Reference
10. Turn on the system and wait for initialization.	
11. Run the Online System Verify of all records, and all speech and prompts.	CP 7001
12. Restart the server and wait for initialization.	
13. Test basic telephony functions.	CP 6201
14. If needed, connect an external modem to Serial port 2. (This connection requires a null modem cable.)	X6270
15. Run a System Information Report and send it to the printer, if installed.	CP 1340
16. Examine the System Information Report and confirm that all features ordered are included.	*VoiceMemo Reference and Configuration Manual*
17. Check the quality of your hardware installation.	CP 6258
18. Complete your post-implementation documentation.	
19. Configure system software.	*Voicememo Reference and Configuration Manual*
20. Configure any optional features.	
21. Configure mailboxes.	*VoiceMemo Reference and Configuration Manual*
22. Arrange a meeting with your project manager for customer turnover and to discuss further plans, including a test plan.	*System Implementation* Guide

Run Verify With System Online

VoiceMemo Release 6.0A and later

This procedure describes how to run an online system verify. An offline verify combines verification of both account records and speech; in the online verify, it is possible to test each category separately. To do a complete verify, all speech and all records must be tested.

It is optional to log the results of the verify for use at a later time. Since the server responds differently based on whether the results are logged, this procedure includes steps to run the verify with and without logging the results.

If any errors are recorded, contact the Technical Assistance Center.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the System Verify Menu. Then go to the task you want to perform.	Menu Map 12

Verify Records and log Results

2. Access the Record Verification Menu and specify that the results are to be logged for future use.

Select: (R) Verify Records
Prompt: Log results ?
Response: Y

Prompt: Results of previous verify will be lost...
Please confirm by entering 'Y'
Response: Y

Prompt: Logging results to disk .....
Record Verification Menu

3. Select the type(s) of records to verify. For standard maintenance of the server, use "Verify All Records." If there is a specific problem with the server, select the appropriate record type to be verified. Note that you must look at the results from the module where you ran the report.

Step *Reference*

Select: (A) Verify All Records

(B) Verify Sibling Lists

(C) Verify Copy Lists

(D) Verify Distribution Lists

(M) Verify Mailboxes

(N) Verify AMIS Lists

(I') Verify Phoneline Exceptions

or

(S) Verify Statistics Data

Response: The server displays dots while performing the verify, then returns to the Record Verification Menu when done.

Verify Records Without logging Results

2. Access the Record Verification Menu and specify no logging of results.

Select: (R) Verify Records
Prompt: Log results ?
Response: N

Prompt: Results will NOT be logged to disk .....
Record Verification Menu

Step	Reference

3. Select the type(s) of records to verify. For standard maintenance of the server use "Verify All Records." If there is a specific problem with the server, select the appropriate record type to be verified.

   Select: (A) Verify All Records

   (B) Verify Sibling Lists

   (C) Verify Copy Lists

   (D) Verify Distribution Lists

   (M) Verify Mailboxes

   (N) Verify AMIS Lists

   (I?) Verify Phoneline Exceptions

   or

   (S) Verify Statistics Data

   Response: The server displays the test results as each test is completed, then returns to the Record Verification Menu.

Verify Speech and log Results

2. Access the Speech Verification Menu and specify that the results are to be logged for future use.

   Select: (S) Verify Speech
   Prompt: Log results ?
   Response: Y

   Prompt: Results of previous verify will be lost...
   Please confirm by entering 'Y'
   Response: Y

   Prompt: Logging results to disk .....
   Speech Verification Menu

Step *Reference*

3. Select the type(s) of speech to verify. For standard maintenance of the server, use "Verify All Speech and Prompts." If there is a specific problem with the server, select either speech or prompts to be verified.

   Select: (A) Verify All Speech and Prompts

   (P) Verify Prompts

   or

   (S) Verify Speech

   Response: The server displays dots while performing the verify, then returns to the Speech Verification Menu when done.

Verify Speech Without logging Results

2. Access the Speech Verification Menu and specify no logging of results.

   Select: (S) Verify Speech
   Prompt: Log results ?
   Response: **N**

   Prompt: Results will NOT be logged to disk .....
   Speech Verification Menu

3. Select the type(s) of speech to verify. For standard maintenance of the server, use 'Verify All Speech and Prompts." If there is a specific problem with the server, select either speech or prompts to be verified.

   Select: (A) Verify All Speech and Prompts

   (P) Verify Prompts

   or

   (S) Verify Speech

   Response: The server displays the test results as each test is completed, then returns to the Speech Verification Menu.

3 Upgrading and Updating Systems

How To Use This Chapter

This chapter provides step-by-step procedures for upgrading and updating a Series 6 Model 70. Additional information is also located in the *VoiceMemo* Reference and *Configuration Manual* and the Centigram Series 6 *Technical Reference Manual.*

A task list and Centigram Procedures (CPs) describing upgrading and updating procedures are located at the end of this chapter. The task list identifies two procedural levels of CPs: a high-level CP and a low-level CP. A high-level CP provides instructions on how to do overall tasks, such as installing a server. A low-level CP provides instructions on more specific tasks, such as how to install a line card.

Readers familiar with Centigram servers can use the CPs as a checklist if desired, while readers new to Centigram servers can use CPs for step-by-step instructions. After gaining experience with this documentation, you can find your own innovative way of using the task list. One possible approach on how to use the task list is provided below:

Using the Task list



Select from the task list the title of the task that you want to perform and note its high-level CP number. Flip through the CPs in this chapter until you find the correct CP number. Follow the instructions given in the CP.

A reference column in each CP contains pointers, when necessary, to supplemental information such as another procedure, a technical reference in the *Centigram Series 6 Technical Reference Manual*, another manual, or menu maps. Use the tabs included with this binder to find referenced supplemental information that is located within this manual.

If you need to interrupt a CP and seek reference information, first mark the CP with your bookmark or otherwise note down where you are in the CP. After you are finished with the reference information, return to the CP and continue to execute the steps where you left off.

Upgrade and Update Task list

VoiceMemo Release 6.0A and later

Task	*Procedure*

Upgrading and Updating Systems

Offline System Software Update	Cl? 6483
Install Optional Feature With System Online..	CP 5402
Perform an Offline Prompts Update	Cl? 6262
Perform an Offline Software Update..	CP 6263
Perform an Online Increase System Hours	CP 702 1

Note: Procedures for building the customer database are in the *VoiceMemo Reference and Configuration Manual.*

For additional information, refer to the *Centigram Series 6 Technical Reference Manual* and the *System Implementation Guide.* For detailed information about optional features, refer to the respective optional feature manual.

Updates to procedures and the Model 70 are issued to the field in Centigram's *Notices to Installers.* You should add them to this guide, as appropriate.

For questions, contact TAC before starting any of these procedures. Be sure the following tasks have been completed before attempting any of these procedures.

- System is stable and free of errors and corruption
- All system backups have been performed

Install Optional Feature With System Online

VoiceMemo Release 6.0A and later

The procedure describes how to install an optional feature with the system online. Be sure the Optional Feature Diskette(s) and the Module Enable Diskette contain the serial number(s) for all disk(s) in the system.

Note: The serial number on the OneView Optional Feature diskette must match the serial number of the hard disk on which OneView is being installed. If you receive an error message about an incorrect serial number, contact your support organization.



CAUTION!

If you are loading a revision support disk (RSD), do it after completion of this procedure. Loading the RSD first, could create an incorrect configuration.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the System Maintenance Additional Options Menu.	Menu Map 12
2. Select the Add Optional Feature(s) program. Select: (A) Add Optional Feature(s) *Prompt:* Enter 'Y' to add optional features, 'N' to stop: *Response:* Y for Yes.	
3. Install the optional feature. *Prompt:* Insert Optional Feature floppy disk in the floppy drive. Enter any key when ready: *Response:* Insert the Optional Feature diskette, then press Enter.	
4. After you have installed the Optional Feature software, the system asks if you want to install another optional feature. *Prompt:* Do you want to install another optional feature? *Response:* Y to install another optional feature and continue from step 3, N if you are done installing optional features. The system automatically edits and saves the configuration files, then returns to the Additional Options Menu.	
5. Exit the VoiceMemo Configuration Offline Menu. You see the following prompt: *Prompt:* Wait for message waiting queues to be empty? *Response:* N to continue.	

Step	*Reference*
6. The following prompt appears: *Prompt:* Wait for paging queues to be empty? *Response:* N to continue.	
7. Exit to the VoiceMemo Configuration - Main Menu, then go to the VoiceMemo Configuration - Offline Menu.	Menu Map 2
8. Duplicate the active configuration. Select (B) Duplicate Active Configuration	
9. Exit to the VoiceMemo Configuration - Main Menu and activate the configuration. *Select:* (A) Activate Configuration	

Perform an Offline Prompts Update

VoiceMemo Release 6.0A and later

This procedure describes the offline process of updating the prompts on the Model 120 or Model 70.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks.



WARNING!

This procedure requires that you shut down the server, resulting in an interruption to call processing. Centigram recommends that you nerform this procedure durine periods of low call traffic.

Step	*Reference*
1. Reach the System Maintenance Menu.	Menu Map 1
2. Execute a system shutdown. Select: (S) System Shutdown Prompt: WARNING! ! This will terminate call processing. Type "shutdown" if you really want to do this Response: shutdown	
3. Specify all modules are to be shut down. *Prompt:* modules to shutdown · *Response:* Enter the a for all modules. The server displays the status of each line of the specified modules as "idle," "active" or "stopped," and updates the status every minute until all lines are stopped. The server stops any calls still in progress after five minutes.	
4. If you are executing a system shutdown, wait for the message- waiting queue to clear. If you are executing a *module* shutdown on a multi-module system, do not wait for the message waiting queue to clear. *Prompt:* Wait for message waiting queues to be empty? *Response:* Y to wait for the queue to clear, N to continue immediately with the shutdown.	

Step *Reference*

5. Decide if you want to wait for paging queues to clear.

   Prompt: Wait for paging queues to be empty?
   Response: Y to wait for the queue to clear,
   N to continue immediately with the shutdown.

   The following messages are then displayed:

```
Message Indicator Request Queue Lengths
active:0      untried:0      retrying:0      calls expected:0

Paging Request Queue Lengths
active:0      untried:0      retrying:0      calls expected:0
```

6. Specify if changes to the status of each module are to be made.

   Prompt: Enable or Disable Modules?
   Response: Y

7. A chart with the status of each module is displayed and then the Module Maintenance Menu is displayed:

```
          *** Module Status ***

+-------+-------+-------+-------+
|   1   |   2   |  I3   |  I4   |  I
+-------+-------+-------+-------+
   ENA      -       -       -
+-------+-------+-------+-------+

ENA  => Module is Enabled
DIS  => Module is Disabled
  -  => Module is not configured


MODULE MAINTENANCE MENU
-----------------------
(D) DISABLE a module
(E) ENABLE a module
(X) Exit
```

8. Change the status of all modules to disabled, changing the status of the module the console is attached to last.

   Select: (D) DISABLE a module
   Prompt: Which Module?
   Response: a

   Prompt: type "disable" to confirm your request:
   Response: disable

Step | *Reference*

9. The server automatically boots to the Maintenance From Hard Disk Menu. Select the prompts.add program.

   Prompt: Enter one of the names:
   Response: prompts-add

10. Load the prompts diskettes.

    Prompt: Insert the 1st diskette containing the prompts and press return
    Response: Insert Prompts Disk 1 then press Enter to continue.

    Prompt: Wait until drive light is out, insert language disc #1, hit CR when ready.
    Response: Press Enter again to continue.

11. The prompts are copied to multiple hard disks, as applicable. The process can take many minutes, depending on the number of hard disks. The server then requests the remaining diskettes.

    Prompt: Working...
    Wait until drive light goes out, insert language disc #2, hit CR when ready.
    Response: Insert the specified diskette then press Enter to continue.

12. The server reads from the floppy disk drive and prompts for each of the remaining diskettes. Insert the remaining diskettes and press Enter when prompted.

13. When the prompts diskettes are complete, the server displays the number of speech blocks that have been used for the system prompts.

    Prompt: For this prompt partition (vid 1):
    xxxx directory entries allocated out of xxxx available
    xxxx pointer sectors allocated out of xxxx available
    xxxx speech blocks allocated out of xxxxx available
    Starting up processes, please wait...

14. Enable all modules.

    Prompt: Enter one of the names:
    Response: **host.status**

    Select: (E) ENABLE a module
    Prompt: Which Module?
    Response: a

The server automatically resets and returns to normal operation.

Perform an Offline Software Update

VoiceMemo Release 6.0A and later

This procedure describes how to update the software on a Model 120 or Model 70. It applies only to Release 6.0 and above. To update software, the server must be shut down and disabled using the procedure described in Cl? 6268.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks.

Step	*Reference*

1. Insert the Floppy Boot Diskette. Press the Reset button or turn on the power to the system. The system boots from the floppy drive. The server displays the self test results.

2. The server reads from the floppy disk, then requests the service diskette.

   Prompt: Insert floppy "SERVICE 6.00" and hit return
   Response: Insert the diskette, then press Enter.

3. The server reads from the floppy disk, and asks which process you want to execute.

   Prompt: Enter one of the names:
   Response: update

step *Reference*

4. The server reads from the floppy disk and issues a warning about the pending process.

Prompt:
```
WARNING! ! ********** UPDATE PROGRAM **********
UPDATE program ONLY updates the system
software files. Data such as accounts,
and speech will remain unchanged (prompts
cleared later on UPDATE program only
if told so). Any billing data files
constructed via the (G)ather command may
be incompatible with the new release. To be,
sure you will not lose billing
information, run a billing report before doing
this update.

=====> The SYSTEM LOGFILE and CDR
information will be lost. To save <=====
=====> this information, obtain hard copy
outputs BEFORE this update <=====

In order to do a complete UPDATE you must have
as a minimum:

     SOFTWARE   DISKETTES
     PROMPTS    DISKETTES
     * Only if you clear prompts during update
process

       ------- WARNING FOR 6.00 USERS ---------
YOU MUST DISABLE ALL THE HOSTS EXCEPT THIS ONE
TO BE ABLE TO USE THIS
OPTION, IF YOU HAVE NOT DONE SO, REBOOT THIS
HOST AND DO IT NOW !!!

 IF YOU DO NOT WANT TO CONTINUE, THEN RE-BOOT
THE  SYSTEM!!  .  ..OTHERWISE
     ... ENTER A CARRIAGE RETURN
```

Response: Press Enter.

The "Warning for 6.00 users" is for a server currently running Release 6.00, since most servers running Release 6.00 can run the Update program online. If you do the procedure from the Floppy Boot Diskette, you must disable all modules.

5. If the server displays the following warning message:

Prompt
```
CP: 6:/xxx write error or disk full
```

Please continue with the update procedure. This is not a fatal problem. However, notify the Technical Assistance Center at (408) 428-3558 of the situation.

Step *Reference*

6. If an old format of billing data is found on the server, the following message is displayed:

   Prompt: Old format of billing report data found. This data must be deleted before proceeding with the software update. To run any billing reports from the last gather, reboot the system now. Proceeding from here will NOT result in any lost billing data provided you have already run all needed reports from the last gather. Note: Future updates will not require report files to be deleted. To proceed with the update, enter "Y" to delete report data:

   To proceed, please enter a 'Y', OR TO ABORT, REBOOT THE SYSTEM.

   Response: **Y**

7. The server continues, then requests the first software diskette.
   The first two lines of the following prompt are seen only if the server located billing information.

   Prompt: Deleting 4:/bill_data...
   Deleting 4:/prev_data...
   When drive light goes out insert disk 1 and press return

   Response: Insert the specified diskette, then press Enter.

8. The server requests the remaining diskettes. Each diskette takes approximately 5 minutes.

   Prompt: When drive light goes out insert disk 2 and press return

   Response: Insert the specified diskette, then press Enter.

9. After all software disks have been loaded, load the prompts.

   Prompt: WARNING!! ALL prompts will be cleared from aplicable partition(s). If you want to clear the prompts, type "clear" If you want to do nothing and continue hit <CR>

   Response: clear, if new prompts are to be loaded.
   Press Enter to skip this process and continue at step 12..

10. The server clears all prompts on the server, then requests the first diskette.

    Prompt: Clearing all prompts.. .All prompt speech cleared
    Insert Prompt Diskette 1 in the floppy drive.
    Enter 'Y' when ready, or 'N' to quit:

    Response: Insert Prompts Diskette Number 1 then Y to continue.

Step	*Reference*

11. The prompts are copied to multiple hard disks, as applicable. The process can take many minutes, depending on the number of disks. The server then requests the remaining diskettes.

Prompt: Verifying diskette...
Insert Prompt Diskette 2 in floppy drive.
Enter 'Y' when ready, or 'N' to quit:
Response: Insert the specified diskette and Y to continue.

12. When the prompts are complete, the server displays the number of speech blocks that have been used for the server prompts.

Prompt: xxxx speech blocks allocated out of 4000 available
Press <CR> to continue...
Response: Press Enter.

13. The server has an option for additional prompts to be loaded.

Prompt: Do you want to add prompts to the system?
Response: Y to add additional prompts to the existing set; follow the instructions supplied, similar to Steps 10 to 12 above.
Otherwise, press Enter.

14. The server has an option for adding and RSD or patch:

Prompt: Do you want to install an RSD or Patch?
Response: Enter Y to add an RSD or patch.
Otherwise, press Enter.

15. To complete the update process, you must load the Module Enable diskette and all the optional features.

Prompt: Does the system have Optional Features?
Response: Y

16. Load the Module Enable diskette or the optional feature.

Prompt: Insert Optional Feature Setup diskette in the floppy drive
Enter <carriage_return> when ready :
Response: Insert the diskette, then press Enter.

Step	*Reference*

17. The server loads the feature and asks if there are more.

    Prompt: XXX Optional Feature is now installed...
    Is there another Optional Feature in the system?

    Response: "XXX" represents the name of the optional feature.
    Enter **Y**, if there are more. Repeat steps 16 and 17 until the Module Enable diskette and all optional features have been loaded.
    Enter N, to end adding optional features and continue with the process.

18. If the server is a multi-module server, or contains a QNET card in Module 1, the. following message is displayed. If the server is a single module, go to step 19.

    Prompt: WARNING: Do NOT reset this module.
    Press the reset button on all other modules, then carriage return.

    Response: Reset the specified modules and press Enter.

    The server waits for the other modules to boot before it continues.

    Prompt: Waiting for the other modules to boot up...
    Updating configuration...Please wait....

    Messages are displayed to the screen showing conversion of records, if any.

19. Exit and reboot to complete the update.

Offline System Software Update

VoiceMemo Release 6.0A and later

This procedure describes how to update the system software on your Centigram Series 6 server to a new release while the server is offline.

Step	*Reference*
1. Review the System History File for any software modifications made to the server.	CP *5304,* Ch. 5
2. Run a System Information report and verify that the serial number(s) of the server hard disks are listed on the Service Diskette and all Optional Feature Diskettes.	CP *1340,* Ch. 2
3. If you use billing reports, perform a "gather" of all billing information.	*VoiceMemo Reference and Configuration Manual*
4. If you use billing reports, print out the billing reports.	
5. Print out the logfile for future reference.	*VoiceMemo Reference and Configuration Manual*
6. Print out any CDR Logfiles you need for future reference.	
7. Run a System Verify. Use either the online or offline verify program.	CP 5701, Ch. 5 or CP 7001, Ch. 2
8. Perform a floppy backup. A backup is done before and after the update procedure.	CP 5703, Ch. 5
9. Shut down the system.	CP 6268, Ch. 5
10. Update the software, prompts, Module Enable diskette, FaxMemo diskette, Receptionist II diskette, and currently installed optional features. If any new optional features are to be added to the server, they are loaded in step 11 of this process. Allow the system to reboot at the end of the software update.	CP 6263
11. Load any new optional features. Features previously loaded on the system were updated in step 10; this step is to load only new optional features. If the server did not ask for the Module Enable diskette, install it now. If there are no new optional features to be added, go to step 12.	CP 5402
12. Perform a second floppy backup using a new set of diskettes.	CP 5703, Ch. 5

Perform an Online Increase System Hours

VoiceMemo Release 6.0A and later

This procedure describes the online process of increasing the system hours on an Centigram Series 6 server. The service diskette with the hard disk(s) serial number(s) is required to complete this process.

FOR THE MODEL 120 AND MODEL 70 **ONLY:** Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks.

Step	*Reference*
1. Reach the System Configuration Menu, then to go the VoiceMemo Configuration Main Menu.	Menu Map 1
2. Increase the system hours. Select: (C) Increase System Hours *Prompt:* Please insert the service diskette in floppy drive and enter any key when ready. *Response:* Insert the service diskette and press Enter. The system reads from the floppy disk and returns to the command line when done.	
3. Reach the Reports Menu.	Menu Map 9
4. Verify that the hours have been changed by running a System Information Report.	

Step	*Reference*

Select: (I) System Information
Prompt: REPORT OUTPUT ROUTING

```
(C) Console (screen)
(P) Console with pause
(1) Printer A
(F) File...
(A) Append to file...
(X) Exit (no report)

If you need help later, type ?.

COMMAND  (C/P/1/F/A/X):
```

Response: C to send the report to the console without pausing
P to send the report to the console, pausing as the screen fills,
1 to send the report to printer A*,
F to send the report to a file on the Series 6 server,
A to append the report to an existing file on the Series 6 server, or
X to exit report output options (no report).

* You can have one or more serial ports on your server with different devices, depending on the configuration of your server.

The system displays the report to the output device you select. If you are sending it to the console, use the following commands to control scrolling:

To stop scrolling:	Press Ctrl-S
To restart scrolling:	Press Ctrl-Q

Verify that the system hours entry reflects the new hours for the system.

4 Replacing FRUs

How To Use This Chapter

This chapter provides troubleshooting instructions and step-by-step procedures for replacing FRUs in a Series 6 Model 70. Additional information is also located in the *VoiceMemo Reference and Configuration* Manualand the *Centigram Series 6 Technical Reference Manual.*

A task list and Centigram Procedures (CPs) describing FRU replacement procedures are located at the end of this chapter. The task list identifies two procedural levels of CPs: a high-level Cl? and a low-level CP. A high-level Cl? provides instructions on how to do overall tasks, such as installing a server. A low-level Cl? provides instructions on more specific tasks, such as how to install a line card.

Readers familiar with Centigram servers can use the CPs as a checklist if desired, while readers new to Centigram servers can use CPs for step-by-step instructions. After gaining experience with this documentation, you can find your own innovative way of using the task list. One possible approach on how to use the task list is provided below:

Using the Task list



Select from the task list the title of the task that you want to perform and note its high-level CP number. Flip through the CPs in this chapter until you find the correct CP number. Follow the instructions given in the CP.

A reference column in each CP contains pointers, when necessary, to supplemental information such as another procedure, a technical reference in the Centigram Series 6 Technical *Reference Manual,* another manual, or menu maps. Use the tabs included with this binder to find referenced supplemental information that is located within this manual.

If you need to interrupt a CP and seek reference information, first mark the CP with your bookmark or otherwise note down where you are in the CP. After you are finished with the reference information, return to the CP and continue to execute the steps where you left off.

Service Strategy

The Model 70 is designed to make installation, system expansions, and service and repair an easy process. Maintenance and administration, either on-site or remote, should be performed on a regular basis.

Field repairs are simplified by replacing components within the Model 70. The eight major components (cabinet, hard disk(s), floppy disk drive, and line cards) are all field replaceable units (FRUs).

A typical service call to repair a failed Model 70 consists of the following steps:

1. If possible, run the Logfile and usage reports to isolate the fault.
2. Check all major cable and component connections.
3. Refer to the troubleshooting section of this chapter and follow the recommended procedures.
4. Remove and replace each major FRU, and try to turn on power to the server.
5. If the server boots after a specific FRU has been replaced, return the defective FRU for repair.

Support Plans

The distributor must choose one of two support options:

- Self-sufficient
- Centigram Service Partner

Self-Sufficient

Distributors who elect the self-sufficient option will handle installation and service issues with their own Centigram Certified Technician (CCT). These distributors must have a technical support group to field questions from their technicians.

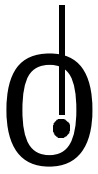
Centigram Service Partner

Distributors who elect the Centigram Service Partner option will choose a third party that has CCTs who have completed the Model 70 installation and service training to handle all of their installation and service activities. The Centigram Service Partner should have a technical support group for its technicians.

If the distributor selects this option, distributor technicians should not work with the Model 70.

Please check with your regional office to determine which plan has been selected and your individual responsibilities for installation and service.

Before You Start



WARNING!

When the server is turned on or while the Model 70 cover is removed, do not attempt to remove or replace any components or peripherals. Hazardous voltage, current, and energy levels are present in this product.



CAUTION!

Electrostatic discharge (ESD) can damage disks, boards and other components. Wearing an anti-static wrist strap attached to a metal part of the server chassis will reduce risk significantly.



DANGER!

Before removing or replacing hardware on your server, make sure the power is off.

Note: Be sure to do each procedure in the correct order.

Servicing and Expanding the Model 70

Follow the steps shown in the Centigram Procedures (CPs) of the Task List at the end of this chapter to service, repair, and expand the capabilities of the Model 70.

Troubleshooting Overview

This section addresses general hardware troubleshooting, or "corrective maintenance." Detailed hardware and software troubleshooting information is located in *the Centigram Series 6 Diagnostics Manual.*

This section assumes the Model 70 has been in service and has subsequently failed. If you experience problems during installation, double check your work to ensure it was done properly and try to restart the server. If the server still fails, call your technical support group for additional instructions.

The troubleshooting process is actually a series of linked processes that include problem recognition, diagnosis, problem or fault isolation, repair, and repair verification.

General Troubleshooting Procedure

Troubleshooting methods depend on a technician's experience and therefore can vary widely. Centigram recommends a systematic approach that you can adapt to most methods. This approach consists of four phases looped as one continuous process:

- Verify the Problem: Ask what has gone wrong? Have any changes been made to the server?
- Isolate the Faulty Unit: Use a process of elimination.
- Repair the Problem: Make sure you determine how and when to make the repair.
- Verify the Repair: Use diagnostic tools to confirm.

In other words, first you need to find out exactly what the problem is. Then you must consider the cause(s) of the problem. Finally, you have to repair the server and check your work. To determine possible causes, you might pose the following questions:

Question	Significance
Did the server fail during hours of high-peak traffic?	If yes, you could suspect software or application problems, or PBX problems.
Was the server working and then suddenly failed during low traffic hours?	If yes, you could exclude server software problems.
Did the server fail after a hardware expansion or upgrade?	If yes, suspect defective new hardware, a hardware configuration problem, a hardware incompatibility problem, or an installation problem.
Are the problems intermittent?	If yes, there could be a loose cable or other random component failures.
Has the company hired new employees?	If yes, the server might be exceeding original capacities.
Have users been properly trained?	If no, problems may be caused by misuse of the server.
Has the server been maintained regularly?	If no, problems may arise. Run System Verify monthly.

Refine your isolation process:

1. Run a Logfile Report to see if there have been an unusual number of system errors or resets. Do not delete the Logfile.

2. Examine the Logfile for errors. See if you can find patterns that indicate a single trouble source.

3. Refer to the specific troubleshooting procedure.

4. Run the Diagnose a Disk With System Online program (CP 7029). This program should detect most problems with the hard disk.

5. If the Diagnose a Disk With System Online program passes, run the Run Verify With System Online program (CP 7001). Check all records, and all speech and prompts.

6. If the Online System Verify program passes, inform users that you are going to shut down the server. Give users a reasonable amount of time to log out of the server.

7. Shut down the system (CP 6268).

Specific Troubleshooting Procedures

The following troubleshooting procedures are groups by topic.

What Happens	What to Do
Application Software Problems	1. Make sure all cables are installed correctly. 2. Verify that server hardware configuration is set correctly. 3. Refer to the *Centigram* Series 6 Diagnostics Manual for assistance. Verify server software is properly configured for the server. Try to reload the software. If this fails, contact your technical support group for additional instructions.
Power Supply Problems	1. Measure voltage (12V/5V) with voltmeter. Voltage should be +/- 10%. 2. Make sure the server is plugged in. 3. Make sure all cables are installed correctly. 4. Check for short-circuits or defective peripherals by unhooking each peripheral one at a time and turning on power to the server. When the server starts, you have isolated the problem.
Communications Failure Server not answering calls *or* Call is answered, but followed by silence	1. Call all stations. The problem could be associated with a bad station port rather than with the Model 70. 2. Check for loose connections. 3. Remove line cord from line card. Plug into a single line loop phone and call the station. Does the phone ring? Do you get dial tone of line? If not, then bad PBX port or bad line cord. Replace.

What Happens	What to Do
Console/Terminal Problems	
Characters on-screen are distorted or incorrect *or* Characters do not appear	1. Make sure the terminal is plugged in and turned on. 2. Check the terminal cable connectors at both ends. 3. Check the brightness and contrast controls. 4. Check the console speed, baud rate, and setup. 5. Enter **Ctrl-Q** to clear the **Ctrl-S**. 6. Reset the console. 7. Restart the server. 8. Check that Green LED on backplane is lit. If not lit, replace backplane fuse.
Console function is missing a prompt or does not react to entry	1. Check console terminal settings. 2. Reset, then try again. 3. If still malfunctioning, do a floppy disk backup first. Then perform an update or reinstall server software using a different set of diskettes.
Server resets terminal's baud rate on restart	1. Disable auto baud detection on the terminal.

What Happens	What to Do
3.5 Floppy Disk Drive Problems	
FDD light does not go on when drive is in use.	Make sure floppy disk drive cables are properly installed.
Cannot boot from Floppy disk drive.	1. Make sure you are using the correct floppy book diskette 2. Make sure the floppy book diskette is in the floppy disk drive. 3. Make sure the floppy disk drive light goes on when you turn on the server. 4. Use On-Site Diagnostics from the Maintenance from the hard disk menu. 5. Turn power off, remove the floppy disk drive and install the spare floppy disk drive (CP 6222). Turn the power on and try again. 6. If the server can be started from the spare floppy disk drive, return the original floppy disk drive for repair.
Cannot backup to diskette	1. Diskette might be defective or it might be full. Try another diskette.
Update, install, or increase hours fails	1. Is service diskette write-protected? If so, disable write-protection. If it still fails, call your technical support protection for a new diskette. 2. Is the service diskette properly serialized? 3. Check the floppy disk drive for failure.

What Happens	What to Do
Hard Disk Problems	
Light does not go on when hard disk is in use.	1. Measure voltage (12V/5V) with voltmeter. Voltage should be +/- 10%. 2. Make sure power and signal cables for the hard disk are properly installed. 3. Check to ensure the hard disk is properly configured (see the *Series 6 Communications Server Technical Reference Manual).*
You are receiving: "Doubly allocated speech blocks" or "Out of range message number" or "Invalid Reference Count"	1. Run Diagnose (Cl? 7029). 2. If Diagnose passes, run System Verify (CP 5701). 3. If System Verify passes and you are still receiving the messages, call your technical support group.
You are receiving: "Self Test 78" error	1. Check cable connections. 2. Replace the hard disk (CP 6221).
Integration Problems	
Some extensions call forward properly with greeting, but some do not.	1. Bring up the Configuration Report (Centigram *Series 6 Diagnostics* Manual). Check that the correct PBX lines terminate in the corresponding Model 70 ports. Check that correct line group for is chosen. 2. If a data link is installed, check it or run the event line monitor *(see VoiceMemo Troubleshooting Guide).* 3. Compare PBX dial strings of working extensions with non-working extensions. 4. Check extension forwarding targets in PBX. 5. Compare Message Waiting indicator types. 6. Check that the mailbox is properly configured

What Happens	What to Do
Line Card Problems	
Poor voice quality on outside calls	1. Use another telephone line and make test calls. If quality improves, it is probably not the line cards. 2. Check line current between the telephone switch and the line card. DB level should be -6 to -12. 3. Check for noise on CO trunks.
Distortion and/or chopping of words	1. Test the telephone lines' signal-to-noise ratio. 2. Check for nearby sources of hum or noise (R-F, FM, motors, etc.). Connect the appropriate line filter to the line card. Using a Digigrabber, check dB level of DTMF digit. If +3 to +8, then need 600 ohm load. 3. Check levels on telephone lines to ensure they are normal. 4. Make sure user's phone is working. 5. With an oscilloscope, check line noise. 6. Check power supply voltages. 7. Replace line card (CP 6220).
All other line card problems	1. Ensure that switch S-1 is in the Ready position. 2. Exchange the phone line (not applicable for Integrations). 3. Read and interpret Logfile Report. 4. Use either a 2500 set or a hand set to test ringing, DTMF, and speech path. 5. With power off, reset line card and retry. Check backplane fuse. 6. With power off, reseat line card (Cl? 6220). 7. With power off, replace the line card with a new one reconfigured for the application (CP 6220).

What Happens	What to Do
System and Miscellaneous Problems	
Silence when prompt should be heard	1. Check line card. 2. Check to see if the problem is common to all line groups. 3. Check to see if user interface (offline menu) is set to standard. 4. Reload the prompts diskettes (Cl? 6262).
Server resets without apparent reason	1. Measure server voltage (12V/5V) with voltmeter. Voltage should be +/-10%. Make sure fans are running and check ground. 2. Make sure power connections are properly isolated from other devices. 3. Check the telephone lines and related equipment for irregular activity. 4. If Tellabs equipment is present, check the shelf voltage/ground. 5. Check Logfile for errors. If errors are found, check configuration. 6. Check 5-volt power on the last line card on the server.
Company greeting sounds distorted	1. Run Diagnose to check for media problems (CP 7029). 2. Run System Verify of all records and all speech prompts (CP 7001). 3. Use a regular telephone, re-record the company greeting. Do not use the Attendant console.

FRU Replacement Task list

VoiceMemo Release 6.0A and later

Task	*Procedure*

Replacing **FRUs**

Remove/Install Cabinet Cover ..... CP 6224
Remove/Install Floppy Disk Drive ..... CP 6222
Remove/Install Hard Disk ..... CP 6221
Remove/Install Line Card ..... CP 6220

Note: Procedures for building the customer database are in the *VoiceMemo Reference and Configuration Manual.*'

For additional information, refer to the *Centigram Series 6 Technical Reference Manual,* and the System *Implementation Guide.* For detailed information about optional features, refer to the respective optional feature manual.

Updates to procedures and the Model 70 are issued to the field in Centigram's *Notices* to Installers. You should add them to this guide, as appropriate.

Remove/Install a Line Card

VoiceMemo Release 6.0A and later

This procedure describes first how to remove and then how to install a line card in a Centigram Series 6 Model 7 0 .



WARNING!

This procedure requires that you shut down the system, which results in an interruption to call processing on the server. Centigram recommends that you perform these steps during periods of low traffic.



DANGER!

Disconnect the server from its power source before connecting either cables or comnonents.



CAUTION!

Protect your server from ESD damage during handling of all comnonents.

Note: You can find TRs referenced in this procedure in the Centigram *Series* 6 *Technical Reference* Manual.

Step	*Reference*

Observe Precautions

1. Put on a grounded wrist strap and attach the other end to the cabinet. Doing so protects the component from electrostatic discharge.
2. Shut down the system and turn off the power, if you have not already done so.



CAUTION!

Removing a component while the power is on can severely damage the component you are working on and other peripherals.

3. Wait one minute after you turn off the power before you remove any components. The hard disk should stop spinning and be quiet.
4. When removing a component, place it on a nonconductive surface, such as an anti-static bag. Make sure you have the anti-static bags before you begin.
5. Put identification tags on all cables and disconnect cables from the server.

Step	*Reference*

Remove the line Card

6. Remove the cover to the server. CP 6224

7. Identify the line card you want to remove. Disconnect all cables from the board you are going to remove.

8. Looking at the line cards from the front of the cabinet, locate the screws that secure the cards in the mother board along the back panel. Remove the screw that holds the line card retaining bracket to the cabinet, as shown in Figure 1.

9. Holding the card at each end, carefully pull the card straight out until the edge connectors are free. Be careful not to scrape the card against other components.



CAUTION!

If removing a line card and not replacing it, install a slot cover over the vacant guide slot in the server back panel.

a. Place the lower end of the cover so that the metal tab fits *outside,* hooking over the cabinet edge. Let the cover lean inward; do not push in or down yet.

b. Pull the slot cover up far enough to hook the prong over the guide and bring it flush with the cabinet wall. Push down to secure the slot cover in place. The slot opening must be covered to maintain the electromagnetic emissions characteristics of the server and ensure proper cooling inside. See Figure 2 for details.

If you are not replacing the removed line card, also remove the cables associated with it.

10. Place the line card in an anti-static protective wrapper and prepare it for return and repair.

Step

Reference

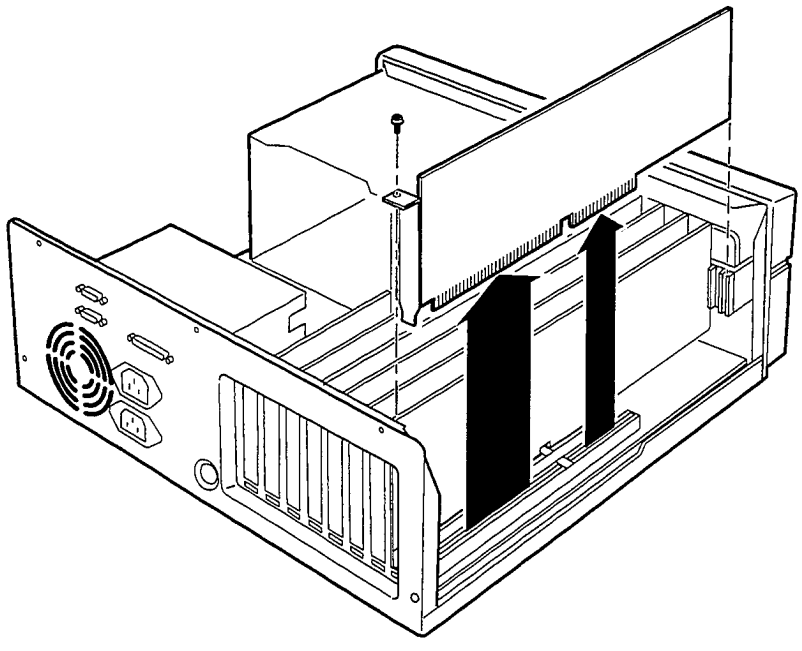


Figure 1 Remove the **Line** Card

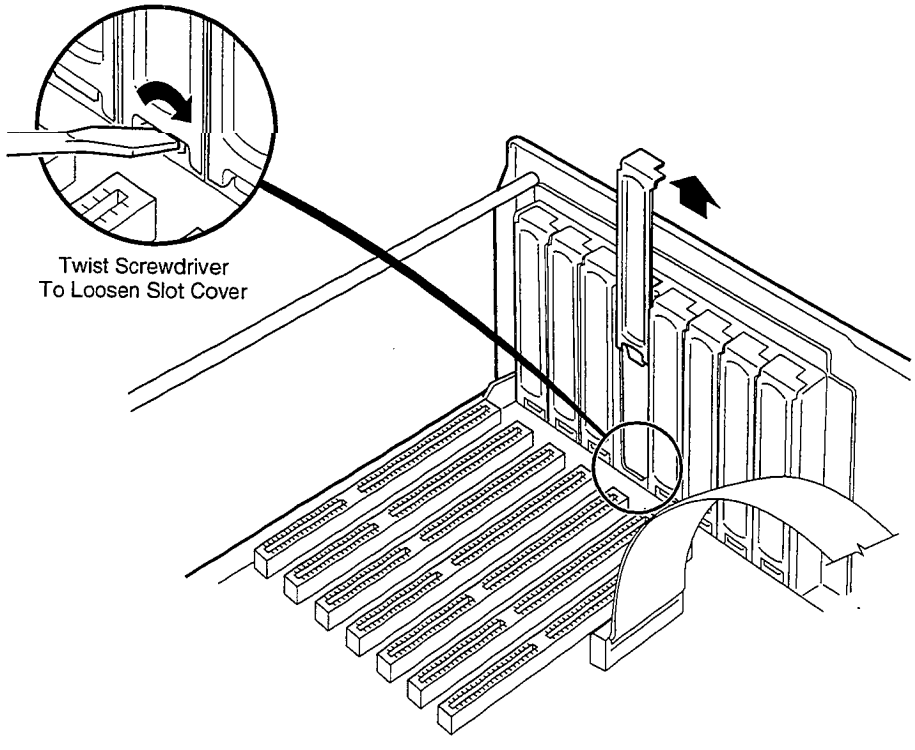


Figure 2 Slot Cover

Step	*Reference*
Install the line Card	
6. Verify that you have the correct kind of line card for this server.	I-R 1920
7. If you are expanding the server and installing a line card into a previously unused slot, remove the slot cover. a. Insert the tip of a small flat-bladed screwdriver in the slot at the lower inside end of the slot cover. b. Slightly twist the screwdriver, popping up the slot cover. From inside the cabinet, lift the slot up and out.	
CAUTION! Be careful not to damage other components when removing the slot cover. You might want to remove cards on either side of the empty slot before you begin to remove the slot cover.	
8. Remove the line card from its wrapper, and place it on a grounded, static-free surface, component side up.	
9. Record the card's serial number in your equipment log.	
10. Set the line cards ID jumpers, configuration jumpers and channel switch settings. For detailed line card configuration procedures, see the *Centigram* Series 6 *Technical Reference Manual*	
11. Hold the card by the top edge or upper corners and firmly press into the connector on the motherboard. (Line cards can be installed in slots 0-5. The server can only support a maximum of 6 line cards.)	
12. Align. the rounded notch in the retaining bracket with the hole in the slot frame.	
13. Insert a 6-32 hex head Phillips screw, but push the notch against the screw before tightening. Otherwise, the bracket might interfere with the bracket of an adjacent slot or with another line card.	
14. Connect cables to the installed line card.	
15. Check the quality of your work and to see that no tools or loose parts are inside the server.	
16. Install the server cabinet.	CP 6224
17. Reconnect all cables to the server. Remove the identification tags from the cables.	

Remove/Install Hard Disk

VoiceMemo Release 6.0A and later

This procedure first describes how to remove and then how to install the hard disk in the Centigram Series 6 Model 70. It also describes how to remove and reinstall the disk carrier. The drive carrier houses both the hard disk and the floppy disk drive.



DANGER!

Disconnect the system from its power source before connecting cables, components, or both.



CAUTION!

Protect your system from ESD damage during handling of all components.

Note: You can find TRs referenced in this procedure in the Centigram *Series 6 Technical Reference Manual.*

Step	*Reference*

Observe Precautions

1. Put on a grounded wrist strap and attach the other end to the cabinet. Doing so protects the component from electrostatic discharge.
2. Shut down the system and turn off the power, if you have not already done so.



CAUTION!

Removing a component while the power is on can severely damage the component you are working on and other peripherals.

3. Wait one minute after you turn off the power before you remove any components. The hard disk should stop spinning and be quiet.
4. When removing a component, place it on a nonconductive surface, such as an anti-static bag. Make sure you have the anti-static bags before you begin.
5. Put identification tags on all cables and disconnect cables from the system.

Step	*Reference*

Remove the Disk Carrier



WARNING!

When the disk carrier is removed from the system, the power switch terminals are accessible. These terminals can have hazardous voltages present even when the power switch is turned off. Unplug the system before performing the procedure. Failure to do so can result in personal injury and/or equipment damage.

6. Remove cabinet cover. — *CP 6224*
7. Disconnect the data and power cables from both the hard disk and the floppy disk drive.
8. Remove the four screws that secure the carrier to the chassis (6-32 hex head Phillips screws). See Figure 1 for details.
9. Slide the carrier toward the back of the system, freeing the left front tab from the slot on the side of the adjacent drive bay. Make sure all the cabling is clear, and lift the carrier up and out of the system. See Figure 1 for details.

Step | Reference

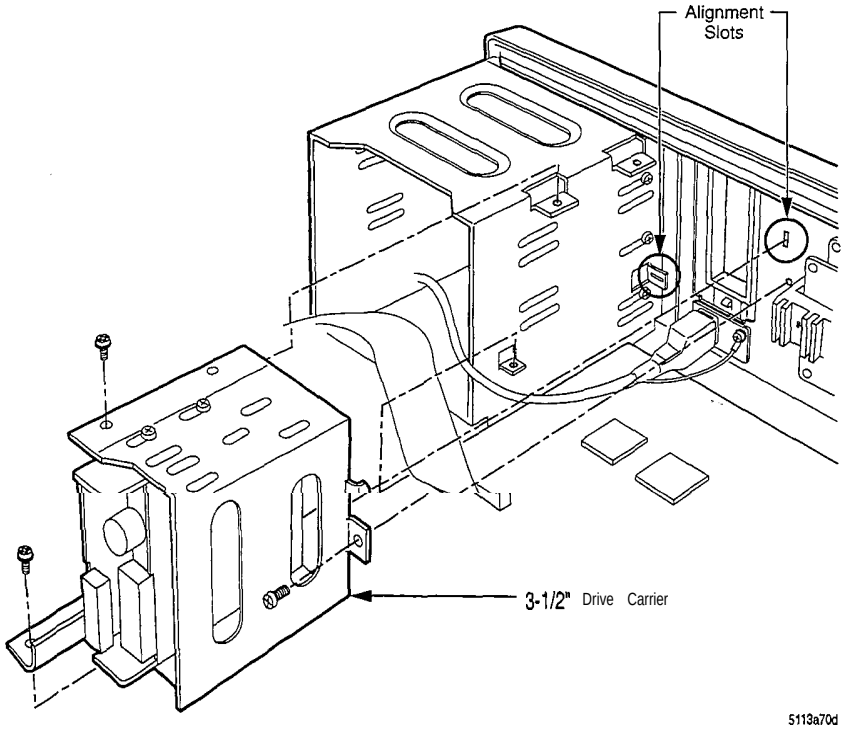


Figure 1 Remove the Hard Disk

Remove the Hard Disk

10. Remove all screws securing the hard disk to the carrier (there are usually three or four). Do not remove the EM1 shield and the filter panel at the front of the bay.

11. Remove the hard disk from the carrier. See Figure 2 for details.

12. If required, transfer data from the old disk to the new disk. — Cl' 6592, Ch. 5

13. Place the hard disk on an anti-static wrapper.

Note: If you are performing fault isolation, install the hard disk into the spare cabinet for testing. If you are replacing the hard disk, prepare it for return and repair.

Step *Reference*

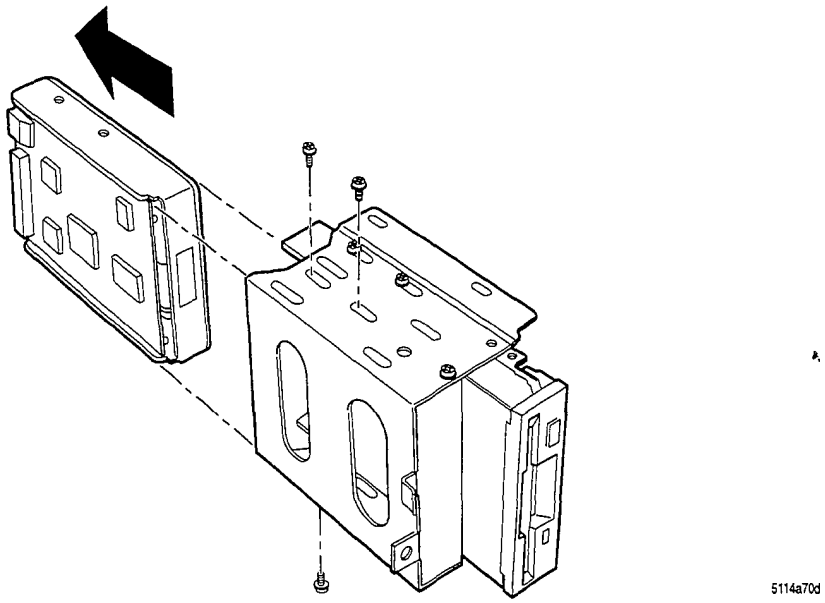


Figure 2 Remove the Hard Disk

Install the Hard Disk and Disk Carrier

Note: If you are performing fault isolation and installing the hard disk into a spare cabinet, remove the disk carrier as previously described.

6. Configure the hard disk, if required. If there are two hard disks in one server, one must be configured as master and the other must be configured as slave. If there is one hard disk in the server, it must be configured as master. Hard disks are shipped from Centigram configured as master. If you are replacing one disk in a two-disk system, be sure to jumper the new disk to match the master or slave disk to be replaced. TR 1923
7. Slide the hard disk into the carrier beside the floppy disk drive and orient in the same direction. The component side of the hard disk should be placed toward the carrier rather than toward the floppy disk drive.
8. Align the mounting holes so that the front edge of the hard disk is between 0.5 inch to 1 .O inches from the front edge of the carrier.
9. Secure the hard disk to the carrier with three or four suitable screws.
10. Make sure the drives are securely fastened in the carrier.
11. Position the carrier above the cabinet. The from of the floppy disk drive faces the front of the cabinet and should line up with the opening in the front panel.

Step	Reference
12. Lower the carrier into the cabinet, lining up the front tab on the carrier with the slot that projects from the side of the 5.25-inch bay.	
13. Slide the carrier toward the front until the left front tab and the screw holes line up.	
14. Secure the carrier into the cabinet using four mounting screws (6-32 hex head Phillips screws).	
Note: If the floppy disk drive needs to be properly aligned with the front bezel, loosen the mounting screws holding it to the carrier by at most one-quarter turn. Adjust the position as needed. Once the floppy disk drive is aligned, tighten the two screws again,	
15. Connect the data cables.	

Step | *Reference*

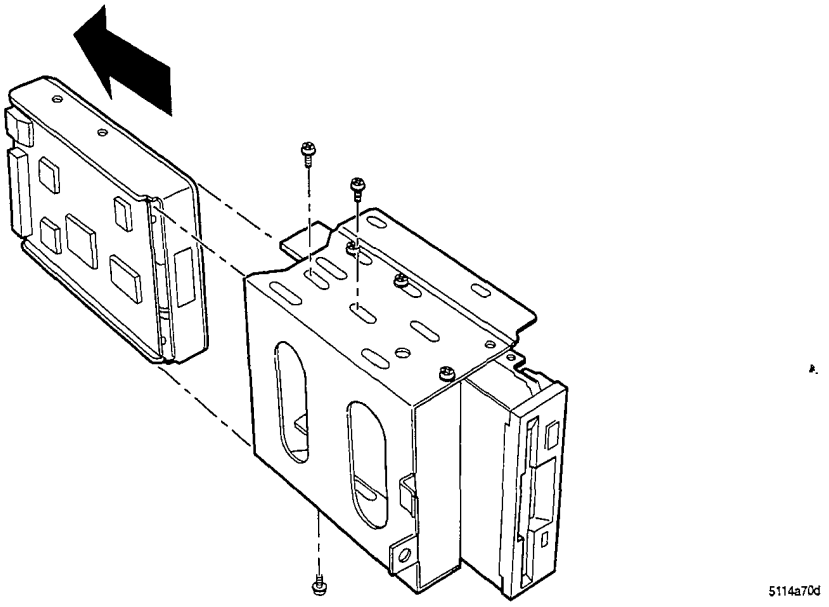


Figure 2 Remove the Hard Disk

Install the Hard Disk and Disk Carrier

Note: If you are performing fault isolation and installing the hard disk into a spare cabinet, remove the disk carrier as previously described.

6. Configure the hard disk, if required. If there are two hard disks in one server, one must be configured as master and the other must be configured as slave. If there is one hard disk in the server, it must be configured as master. Hard disks are shipped from Centigram configured as master. If you are replacing one disk in a two-disk system, be sure to jumper the new disk to match the master or slave disk to be replaced. CR 1923
7. Slide the hard disk into the carrier beside the floppy disk drive and orient in the same direction. The component side of the hard disk should be placed toward the carrier rather than toward the floppy disk drive.
8. Align the mounting holes so that the front edge of the hard disk is between 0.5 inch to 1 .O inches from the front edge of the carrier.
9. Secure the hard disk to the carrier with three or four suitable screws.
10. Make sure the drives are securely fastened in the carrier.
11. Position the carrier above the cabinet. The front of the floppy disk drive faces the front of the cabinet and should line up with the opening in the front panel.

Step	*Reference*

12. Lower the carrier into the cabinet, lining up the front tab on the carrier with the slot that projects from the side of the 5.25-inch bay.

13. Slide the carrier toward the front until the left front tab and the screw holes line up.

14. Secure the carrier into the cabinet using four mounting screws (6-32 hex head Phillips screws).

    Note: If the floppy disk drive needs to be properly aligned with the front bezel, loosen the mounting screws holding it to the carrier by at most one-quarter turn. Adjust the position as needed. Once the floppy disk drive is aligned, tighten the two screws again.

15. Connect the data cables.

Remove/Install Floppy Disk Drive

VoiceMemo Release 6.0A and later

This procedure first describes how to remove and then how to install the floppy disk in the Centigram Series 6 Model 70. It also describes how to remove and reinstall the drive carrier. The drive carrier houses both the floppy disk drive and the hard disk. For detailed floppy disk drive specifcations, see TR 192 1 in the Centigram Series 6 *Technical Reference Manual.*



DANGER!

Disconnect the server from its power source before connecting cables, components, or both.



CAUTION!

Protect your server from ESD damage during handling of all components.

Step *Reference*

Observe Precautions

1. Put on a grounded wrist strap and attach the other end to the cabinet. Doing so protects the component from electrostatic discharge.
2. Shut down the system and turn off the power, if you have not already done so.



CAUTION!

Removing a component while the power is on can severely damage the component you are working on and other peripherals.

3. Wait one minute after you turn off the power before you remove any components. The hard disk should stop spinning and be quiet.
4. When removing a component, place it on a nonconductive surface, such as an anti-static bag. Make sure you have the anti-static bags before you begin.
5. Put identification tags on all cables and disconnect cables from the server.

Step	*Reference*

Remove the Drive Carrier



WARNING!

When the drive carrier is removed from the server, the power switch terminals are accessible. These terminals can have hazardous voltages present even when the power switch is turned off. Unplug the server before performing the procedure. Failure to do so can result in personal injury and/or equipment damage.

6. Remove the cabinet cover. — CP 6224
7. Disconnect the data and power cables from both the floppy disk drive and the hard disk.
8. Remove the four screws that secure the carrier to the cabinet (6-32 hex head Phillips screws).
9. Slide the carrier toward the back of the server, freeing the left front tab from the slot on the side of the adjacent drive bay. Make sure all the cabling is clear, and lift the carrier up and out of the server. See Figure 1 for details.



CAUTION!

Support the carrier as you remove it from the cabinet. Be careful not to damage components on the motherboard.

Step | Reference

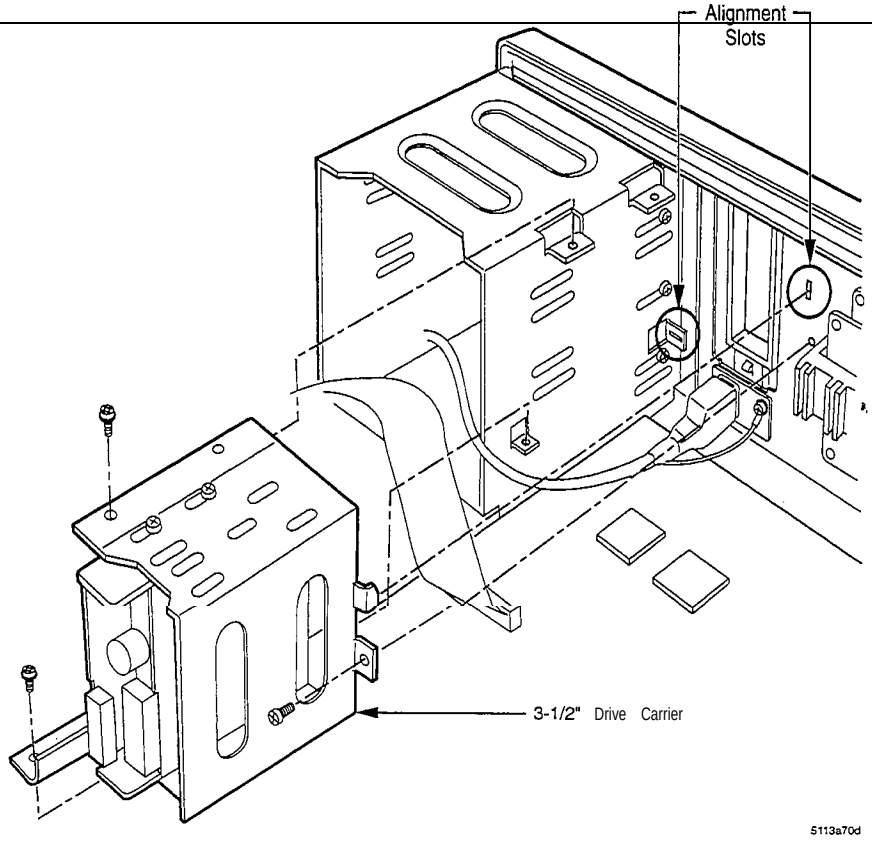


Figure 1 Remove the Drive Carrier

Remove the Floppy Disk Drive

10. Remove the three screws that secure the floppy disk drive to the carrier (M3-6 hex head Phillips screws; these screws differ from the ones that secure the drive carrier to the cabinet).

11. Remove the floppy disk drive from the carrier. See Figure 2 for details.

12. Place the floppy disk drive on an anti-static wrapper.

Note: If you are performing fault isolation, install the floppy disk drive into the spare cabinet for testing. If you are replacing the floppy disk drive, prepare it for return and repair.

Step *Reference*

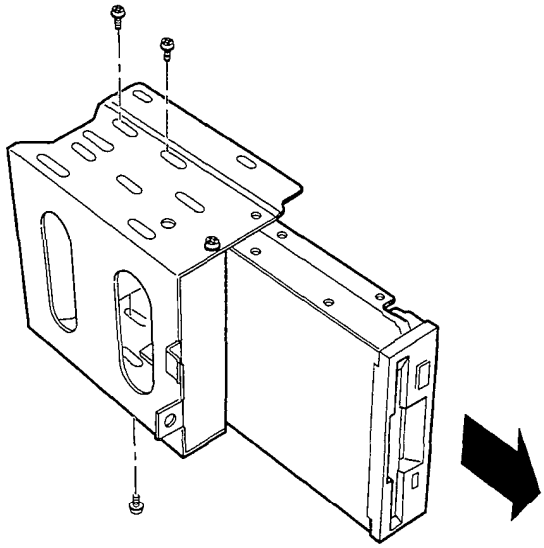


Figure 2 Remove the Floppy Disk Drive

Install the Floppy Disk Drive and Drive Carrier

Note: If you are performing fault isolation and installing the floppy-disk drive into a spare cabinet, remove the drive carrier as previously described.

7. Orient to the front of the cabinet and slide the floppy disk drive into the drive carrier beside the hard disk.
8. Align the mounting holes with the carrier holes.
9. Install three screws (M3-6 hex head Phillips screws), two at the top of the carrier and one at the bottom.
10. Make sure the drives are securely fastened in the carrier.
11. Position the carrier above the cabinet. The front of the floppy disk drive faces the front of the cabinet and should line up with the opening in the front panel.
12. Lower the carrier into the cabinet, lining up the front tab on the carrier with the slot that projects from the side of the 5.25-inch bay.
13. Slide the carrier toward the front until the left front tab and the screw holes line up.

Step	*Reference*
14. Secure the carrier into the cabinet using four mounting screws (6-32 hex head Phillips screws). - If the floppy disk drive needs to be properly aligned with the front bezel, loosen the mounting screws holding it to the carrier by at most one-quarter turn. Adjust the position as needed. Once the floppy disk drive is aligned, tighten the two screws again.	
15. Connect the data cables to the drives. - Connect floppy disk drive to J 13. - Connect hard disk to J14.	
16. Connect power cables to the drives.	
17. Check the quality of your work and to see that no tools or loose parts are inside the server.	
18. Install the cabinet cover.	CP 6224
19. Reconnect external cables to the server. Remove the identification tags from the cables.	
20. Turn server power on.	

Remove/Install Cabinet Cover

VoiceMemo Release 6.0A and later

This procedure describes how to remove and replace the system cabinet in the Centigram Series 6 Model 70.



DANGER!

Shut down the system and turn the power off before you begin any procedures in this section. Failure to do so will result in severe electrical shock or burns.



CAUTION!

Removing a component while the power is on can severely damage the component you are working on and other peripherals.



CAUTION!

Protect your server from ESD damage during handling of all components.

Step	*Reference*

Observe Precautions

1. Put on a grounded wrist strap and attach the other end to the cabinet. Doing so protects the component from electrostatic discharge.
2. Shut down the system, turn off the power, and unplug the unit. Detach the power cord from the power input assembly.
3. Wait one minute after you turn off the power before you remove any components. The hard disk should stop spinning and be quiet.

Remove the Server Cabinet

4. Label and remove external cables from the server.
5. Remove the five retaining screws from the cover (6-32 hex head Phillips screws) at the back of the cabinet. See Figure 1 for the locations of the screws.
6. Standing behind the server, hold both sides of the cover at the back and press against the back panel with your thumbs. This pops the cover loose. Slide it toward the back one inch. Then lift the cover up. See Figure 1 for details.

Step | *Reference*

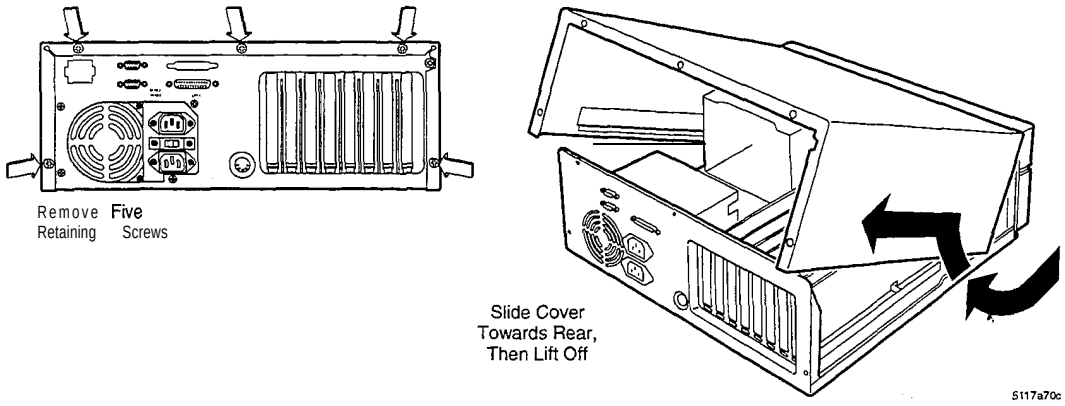


Figure 1 Remove the Cabinet Cover

Install the Server Cabinet

4. Check the quality of your work and make sure no tools or loose parts are inside the system.
5. Lower cover with front edge about one inch from bezel. Slide the lip on the front edge forward under the bezel. Make sure the side panels are outside the metal rails and sides of the cabinet
6. Reinstall the five retaining screws in the back panel.
7. Reconnect external cables to the server. Remove any identification tags you placed on the cables.
8. Turn power on.

5 System Administration

How To Use This Chapter

This chapter provides step-by-step procedures for system administration functions on a Centigram Series 6 Model 70. Additional information is also located in the *VoiceMemo Reference and Configuration Manual* and *the Centigram Series 6 Technical Reference Manual.*

A task list and Centigram Procedures (CPs) describing system administration procedures are located at the end of this chapter. The task list identifies two procedural levels of CPs: a high-level CP and a low-level CP. A high-level Cl? provides instructions on how to do overall tasks, such as installing a server. A low-level Cl? provides instructions on more specific tasks, such as how to install a line card.

Readers familiar with Centigram servers can use the CPs as a checklist if desired, while readers new to Centigram servers can use CPs for step-by-step instructions. After gaining experience with this documentation, you can find your own innovative way of using the task list. One possible approach on how to use the task list is provided below:

Using the Task List



Select from the task list the title of the task that you want to perform and note its high-level CP number. Flip through the CPs in this chapter until you find the correct CP number. Follow the instructions given in the CP.

A reference column in each CP contains pointers, when necessary, to supplemental information such as another procedure, a technical reference in *the Centigram Series 6* Technical *Reference Manual:* another manual, or menu maps. Use the tabs included with this binder to find referenced supplemental information that is located within this manual.

If you need to interrupt a CP and seek reference information, first mark the CP with your bookmark or otherwise note down where you are in the CP. After you are finished with the reference information, return to the CP and continue to execute the steps where you left off.

System Administrtition

The system administrator is responsible for creating and maintaining all mailboxes and their functionality on the server. The Model 70 allows the administrator to perform the following tasks:

- Configure and customize the server
  - Create and modify, delete and/or reassign mailboxes
  - Build classes of service (FCOS, LCOS, GCOS, NCOS, RCOS, and TCOS)
  - Change the server time and date, when required
  - Set up system-wide distribution lists and broadcast mailboxes
  - Create the "message of the day"
  - Create phoneline exceptions — that is, any telephony parameter (for example, the interface between the Model 70 and the PBX or Centrex) that does not use the Model 70 default values (North American Signaling Standards)
  - Add optional features and expand capacities
- Create system and client reports
  - Statistics: five reports covering how server resources are used (for example, usage of line ports, speech storage, trunks and messages)
  - System information: ten reports which give specific information about how the server is configured and programmed (see the *VoiceMemo Reference* and *Configuration Manual)*
  - Billing: four reports which give breakdowns of charges for individual users by statistic and which calculate the total amounts due for departmental or account billback (see the *VoiceMemo Reference and Configuration Manual)*
- Perform maintenance, backup, and troubleshooting
  - Routine maintenance of software files
  - System backups and restore

- System diagnostics and fault isolation

The Model 70 application comes pre-installed with default values that can easily be changed through the console, The server issues prompts to guide the administrator. You can enter a question mark (?) in response to any prompt to receive online help.

Administration security features include console passcode protection so that unauthorized users can not access the Model 70 from a terminal.

Administration by Phone

Limited system administration can be performed over the telephone, through the administrator's mailbox. These functions include:

- Creating, deleting, and modifying mailboxes
- Changing mailbox passcodes
- Changing the system clock
- Getting usage statistics
- Backing up server to diskette, if the back up fits on one diskette

In addition to passcode protection, the timing parameters built into the server are used to prevent unauthorized access to and from an administrator's mailbox. The timing parameters function as follows:

- The Model 70 allows three to five seconds of response time for each prompt before announcing "no change" and returning to the Administration Menu.
- If more time is needed, the administrator can press "1" in response to a prompt to restart the timer. The server issues an error message and repeats the prompt.

Centigram recommends against assigning a name or individual greeting to the administrator's mailbox. Unauthorized users should not know that they have accessed a special purpose mailbox.

Instructions for Administration by Phone are located in the *VoiceMemo Reference and Configuration Manual.*

Administrative Hardware

Note: The customer must provide all administrative equipment.

You must have a standard VT100 compatible terminal for system administration. An outboard modem is also required for remote administration. If you plan to administer the Model 70 both on-site and remotely, an A/B box (console or modem active) is also required.

Worksheets

Worksheets facilitate installation and help you establish a paper trail backup for all work done on the server.

Worksheets establish system and individual mailbox parameters, groups and classes of service, special application mailboxes, outdial notification operations, message waiting indication, and integration parameters. These worksheets are found in the *VoiceMemo Reference* and *Configuration Manual.* If you do not have the necessary worksheets, contact your sales organization.

System Administration Task list

VoiceMemo Release 6.0A and later

Task	*Procedure*

System Administration

Activate New Software	*Cl? 7025*
Add or Cancel a Phoneline Exception	CP *7022*
Back Up a Class of Service	*Cl? 5412*
Change Module Status From Hard Disk..	Cl' 5314
Diagnose a Disk With System Online	CP *7029*
Disk Addition (add.disk)	CP *6282*
Do a Floppy Backup	CP 5703
Do a System Reload (system.reload)	CP 6267
Do a System Restore (system.restore)	CP 5704
Enable a Hard Disk	*cl? 7019*
Enable a Module	CP 7014
Name the Configurations	CP 7004
Offline Disk Replacement (Non-Redundant/Redundant Systems).	C P 6592
Online Disk Replacement (Redundant Systems)	CP 6283
Recover a Lost Console Passcode	CP 5303
Redundant Disk Addition (make,redundant)	CP 628 1
Restore a Class of Service	CP 5413
Run Diagnose From Diskette	CP 703 1
Run Diagnose From Hard Disk	CP 7030
Run Verify With System Offline	CP *5701*
Set the Site Name, Banner, and Code	CP 5415
Set the System Time and Date	CP 5414
Shut Down a Hard Disk..	CP 7017
Shut Down a System	CP 6268
Update Disk Redundancy	CP 7015
View Hard Disk Operational Parameters	CP 5313
View or Edit History File	CP 5304
View the Configuration Names..	.CP 7005

Note: Procedures for building the customer database are in the *VoiceMemo Reference and Configuration Manual.*

For additional information, refer to the *Centigram Series 6 Technical Reference Manual,* and the *System Implementation Guide.* For detailed information about optional features, refer to the respective optional feature manual.

Updates to procedures and the Model 70 are issued to the field in Centigram's Notices *to Installers.* You should add them to this guide, as appropriate.

Recover a Lost Console Passcode

VoiceMemo Release 6.0A and later

This procedure describes how to access the console after the Root or Super-user console passcode has been lost.

It is assumed the module attached to the console has been shut down following the procedure listed in CP 6268.



WARNING!

This procedure requires the server to be removed from normal operation. Centigram recommends that you run this process during periods of low call traffic.

Step	*Reference*

1. Start the Series 6 server and bypass the normal login and password.

   Prompt: `Login :`
   Response: bypass

   Prompt: `Password:`
   Response: bypass

2. When prompted, insert the Service diskette..

   Prompt: `Insert the SERVICE diskette, then press<Enter> to continue.`
   Response: Insert the Service diskette and press Enter.

3. Enter the new password.

   Prompt: `Enter new password:`
   Response: The new Root or Superuser password, up to 253 alphanumeric characters.

   Prompt: `Re-enter new password:`
   Response: Repeat the new root or Superuser password.

   The following message appears:

   `Password changed.`

4. The server then automatically starts the console.

View or Edit History File

VoiceMemo Release 6.0A and later

The History File is a record of modifications made to the server. Entries are made to the record by the system administrator, your distributor, or Centigram technical personnel. You must review this record prior to updating software on the server to verify that no custom changes have been made to the server that are over-written with the new software.

This procedure describes how to view or edit the History File.

Step	*Reference*
1. Reach the System Maintenance Menu, then from the Additional Options Menu go to the Utility Menu, then to the History Menu.	Menu Map 12

Show the History File

2. Review the History File.

   Select: (S) Show file
   Prompt: Enter record number or 'a' for all non-empty records:
   Response: Number of a specific record to review, or A for all non-empty records.

   The server displays the file to the console. Use the following commands to control scrolling:

   To stop scrolling: Press Ctrl-S
   To restart scrolling: Press Ctrl-Q

Update the History File

3. Enter information to the History File.

   Select: (U) Update file
   Prompt: Contact person name:
   Response: Name of the person who made changes to the server, up to 15 characters.

   Prompt: Reported problem:
   Response: Description of the problem you encountered, up to 79 characters.

   Prompt: Fixed problem:
   Response: Description of changes you made to the server to correct the reported problem, up to 159 characters.

   Prompt: Other comments:
   Response: *Any* other necessary information, up to 79 characters; press Enter to leave blank.

View Hard Disk Operational Parameters

VoiceMemo Release 6.0A and later

This procedure describes how to determine the hard disk size and manufacturer.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the Hard Disk Utilities Menu.	Menu Map 8

2. Review the hard disk information.

   Select: (0) Display the Operation Parameters for a disk
   Prompt: Enter the hard disk as 'bus:id' pair:
   Response: The bus and SCSI ID numbers, separated by a colon, of the disk to be reviewed.

- The following is a sample Operational Parameters Report.

```
Operational Parameters for Hard Disk 0:0

        Vendor: FUJITSU
        Model:  M2684S-512
        Rev:    2026

Page 1 - Error Recovery Parameters
AWRE: TRUE          ARRE: TRUE
TB  : FALSE         RC  : FALSE
EER : FALSE         PER : TRUE
DTE : FALSE         DCR : FALSE
Read retry count:           4
Correction span:            22
Head offset count:          0
Data strobe offset count:   0
Write retry count:          0
Recovery time limit:        0

Changeable page 1 data:
flags=0xef, rd_retry=255, c_span=0, hd=0, ds=0,
wt_retry=0, rcv=0

Page 2 - Disconnect/Reconnect Parameters
Buffer full ratio:                  0
Buffer empty ratio:                 0
Bus inactivity limit:               50
Disconnect time limit:              12800
Connect time limit:                 0
Maximum burst size :                0
Data transfer disconnect control:   0

Changeable page 2 data:
bf_ratio=255, be_ratio=255, inact=0, disc=0, con=0,
burst=0, dtdc=0
```

Step	*Reference*

```
        Page 3 - Format Parameters
Tracks per zone:                        6
Alternate sectors per zone:             3
Alternate tracks per zone:              0
Alternate tracks per logical unit:  6
Sectors per track:                      -74
Data bytes per sector:                  512
Interleave factor:                      1
Track skew factor:                      23
Cylinder skew factor:                   29
Flags:                                  0x40

        Changeable page 3 data:
tpz=0, aspz=65535, atpz=0
atpl=65535, sec_per_trk=0, data_bytes=65535
interleave=0, trk_skew=0, cyl_skew=0, flags=0x0

        Page 4 - Drive Geometry Parameters
Number of cylinders:                2380
Number of heads:                    6
Write precomp cylinder:             0
Redunced write current cylinder:  0
Step rate:                          0
Landing zone:                       0
RPL:                                0
Rotational offset:                  0
Rotational offset:                  0
Disk capacity:                      1039328
Press any key to continue....
```

3. Press any key to return to the Hard Disk Utilities Menu.

Change Module Status From Hard Disk

VoiceMemo Release 6.0A and later

This procedure describes how to change the status of a module using the Maintenance From Hard Disk Menu. When changing the status of multiple modules, always change the one the console is attached to last.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks. All SCSI references in this procedure are for SCSI servers only.

step . *Reference*

1. Boot the system to the Maintenance From Hard Disk Menu. If the module is currently disabled, it will boot to the Maintenance From Hard Disk Menu by default.

   Prompt: Run MAINTENANCE from Hard Drive?
   Response: *y*

2. Specify the program you want to execute.

   Prompt: Enter one of the names:
   Response: **host.status**

3. Go to the task you want to perform.

Enable The Module

4. Enable the module.

   Select: (E) ENABLE a module
   Prompt: Input a host id in the following range:
   n n n n
   Which module?
   Response: Enter the number of the module you want to enable. (Enter 1 or a for AIP120/70.)

   Note: When changing the status of multiple modules, change the module attached to the console last.

   The module you specify automatically resets itself and returns to normal operation.

5. Repeat step 4 to enable multiple modules. (Not vaild for Model 120 or Model 70.)

Step *Reference*

Disable The Module

6. Shut down the module.

   Select: (D) DISABLE a module
   Prompt: Input a module id in the following range:
   n n n n
   Which module?
   Response: Enter the number of the module you want to shut down. (Enter 1 or a for AIP120/70.)

   Note: When changing the status of multiple modules, change the module attached to the console last.

   Prompt: Type "disable" to confirm your request:
   Response: disable

   The module you specify automatically resets itself and boots in the Maintenance from Hard Disk Menu.

7. Repeat step 6 to enable multiple modules. (Not vaild for Model 120 or Model 70.)

Back Up a Class of Service

VoiceMemo Release 6.0A and later

This procedure describes how to back up the defined Classes Of Service (COS) for the system. This program should be run in addition to the floppy backup program. This program is not a replacement for the floppy backup program.

Step	*Reference*
1. From the System Maintenance Menu, go to the System Configuration Menu.	Menu Map

2. Start the backup.

   Select: (B) Backup COS
   Prompt: `VoiceMemo Selective Backup`

   `Insert Backup Diskette 1 in floppy drive`
   `Enter 'Y' when ready, 'N' to quit`
   Response: Insert the floppy diskette and press Y to continue,
   N to quit.

3. If the diskette has not been formatted in QNX, format the diskette.

   Prompt: `Invalid backup diskette...need formatting`
   `Enter 'Y' for formatting, or 'N' to quit:`
   Response: Y to format the diskette,
   N to abort the backup process.

   The system formats the diskette, if required, then proceeds with the backup.

4. Insert more diskettes as specified by the server.
5. Store the diskettes in a safe location.

Restore a Class of Service

VoiceMemo Release 6.0 and later

This procedure describes how to restore the defined Classes Of Service (COS) for the server. This program is not the same as the restore program found on the Maintenance From Hard Disk Menu.

Step	*Reference*
1. From the System Maintenance Menu, go to the System Configuration Menu.	Menu Map 1

2. Start the restore.

   Select: (A) Restore COS
   Prompt: VoiceMemo System Configuration, FCOS and LCOS Restore Program

   Insert Backup Diskette 1 in floppy drive
   Enter 'Y' when ready, 'N' to quit
   Response: Insert the floppy diskette and press Y to continue,
   N to quit.

   The server verifies the diskette.

3. Specify the types of Classes of Service to be restored.

   Prompt: Do you want to restore the FCOS's?
   Response: Y to restore,
   N or Enter to not restore.

   Prompt: Do you want to restore the LCOS's?
   Response: Y to restore,
   N or Enter to not restore.

   Prompt: Do you want to restore the NCOS's?
   Response: *Y* to restore,
   N or Enter to not restore.

   The server restores the specified Classes of Service and returns to the System Configuration Menu.

Set the System Time and Date

VoiceMemo Release 6.0A and later

This procedure describes how to set the system time and date.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the System Maintenance - Additional Options Menu.	Menu Map 12
2. Change the time and date as necessary. Select: (T) Time and Date *Prompt:* System time/date: [current settings] Enter new value or press <CR> to leave unchanged. Enter date (mm-dd-yy) *Response:* The correct date in the format of mm-dd-yy, or press Enter to keep the current information. *Prompt:* Enter time (hh:mm [am/pm]) *Response:* The correct time in the format of hh:mm and the am or pm designation, or press Enter to keep the current information. The server responds with the entered time and date, then returns to the System Maintenance - Additional Options Menu. Note that all modules are set to the same time.	

Set the Site Name, Banner, and Code

VoiceMemo Release 6.0A and later

This procedure describes how to set the site name, site banner, and the site code.

Step	*Reference*
1. Reach the System Maintenance Menu.	Menu Map 1
2. Change the site name. Select: (N) System Name. Code, and Banner *Prompt:* Enter 'Y' to change the site name, 'N' to keep the current site name: *Response: Y* to change the name, N to keep the current name.	
3. If you answered yes to step 2, then enter the new site name, otherwise continue at step 4. *Prompt:* Enter new site name (return for none): *Response:* Enter a descriptive name, up to 60 characters.	
4. Change the site code. *Prompt:* Enter 'Y' to change the site code, 'N' to keep the current site code: *Response:* Y to change the site code, N to keep the current site code.	
5. If you answered yes to step 4, then enter the new site code, otherwise continue at step 6. *Prompt:* Enter new site code (return for none): *Response:* Enter a code, up to 10 characters.	
6. Change the site banner. *Prompt:* Enter 'Y' to change the site banner, 'N' to keep the current site banner: *Response:* Y to change the site banner, then enter the new site banner, N to keep the current site banner.	
7. If you answered yes to step 6, then enter the new site code, otherwise continue at step 8. *Prompt:* Enter new site banner (return for none): *Response:* Enter a banner, up to 240 characters. To acknowledge the end of the text enter a period (.) on a new line and press Enter.	
8. The system returns to the System Maintenance Menu.	

Run Verify With System Offline

VoiceMemo Release 6.0A and later

This procedure describes how to execute an offline system verify. The verify can be run only if all modules are shut down. For information regarding online system verification, *see CP 700* 1.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks. All SCSI references in this procedure are for SCSI servers only.



WARNING!

This procedure requires that you shut down the server resulting in an interruption to call processing. Centigram recommends that you perform this procedure during periods of low call traffic.

Step	*Reference*
1. Reach the System Maintenance Menu.	Menu Map 1
2. Execute a system shutdown. *Select:* (S) System Shutdown Prompt: WARNING!! This will terminate call processing. Type "shutdown" if you really want to do this *Response:* shutdown	
3. The server asks which modules are to be shut down. *Prompt:* hosts to shutdown? *Response:* a for all. *Prompt:* Wait for Message Waiting? *Response:* Y to wait for message waiting queue to clear.	
4. When the Series 6 server has taken all lines of the server off-hook, it continues by asking if a verify is to be executed. *Prompt:* Perform Offline System Verification? *Response: Y* to execute the verify.	
5. The server asks if the results of the verify are to be recorded. The default is yes. *Prompt:* Log results? *Response: Y* or press Enter.	

Step | *Reference*

6. When the verify is complete, the system continues with the shutdown, asking if the server should wait while the message waiting indicators are updated. If any errors were encountered during the verify, contact the Technical Assistance Center.

7. Change the status of the modules if desired.

   Prompt: Enable or Disable Modules?
   Response: Y to change the status of modules,
   N to keep the module status the same and continue at step 11.

8. If you answered yes in step 7, a chart with the status of each module is displayed and then the Module Maintenance Menu is displayed.

9. To enable a module:

   Select: (E) ENABLE a module
   Prompt: Which Module?
   Response: Enter the number of the module to be enabled. If enabling multiple modules, enable the module attached to the console last. (Enter 1 or a for Model 120 or Model 70.)

10. To disable a module:

    Select: (D) DISABLE a module
    Prompt: Which Module?
    Response: The number of the module. If disabling multiple modules, disable the module attached to the console last. (Enter 1 or a for Model 120 or Model 70.)

    Prompt: type "disable" to confirm your request:
    Response: disable

    If enabling or disabling multiple modules, repeat step 9 or step 10 as appropriate. If the status of the module attached to the console was changed, the balance of this procedure is not be seen due to the module resetting.

11. When done configuring the module, exit the menu. The system completes the shutdown.

    Prompt: ***SHUTDOWN COMPLETE***

    The System Maintenance Menu is displayed, even though the server is not operational.

12. Reach the Reports Menu. — Menu Map 9

Step	*Reference*

13. Review the Verify Report.

    Select: (V) Verify
    Prompt: Report destination:
    Response: *c*

    If any errors were recorded in the report, contact the Technical Assistance Center.

14. Exit to the Main Menu.

15. Turn off the system power or press the reset button(s) to reboot.

Do a Floppy Backup

VoiceMemo Release 6.0A and later

This procedure describes how to perform a floppy backup of the Series 6 server.

step	*Reference*
1. Reach the System Maintenance Menu.	Menu Map 1
2. Initiate the floppy backup. Select: (F) Floppy Backup *Prompt:* `Insert Backup Diskette 1 in floppy drive` `Enter 'Y' when ready, or 'N' to quit:` *Response:* Insert the diskette and enter Y to continue, N to abort the backup process.	
3. If the diskette has not been formatted in QNX, format the diskette. *Prompt:* `Invalid backup diskette...need formatting` `Enter 'Y' for formatting, or 'N' to quit:` *Response:* Y to format the diskette, N to abort the backup process. The system formats the diskette, if required, then proceeds with the backup.	
4. Insert more diskettes as specified by the server. The server produces a report to the console when the backup is complete, then returns to the System Maintenance Menu.	

Perform a System Restore (system.restore)

VoiceMemo Release 6.0A and later

This procedure describes how to perform a system restore.

It is assumed the Series 6 server has been shut down and all modules disabled using the process described in CP 6268.



WARNING!

During this procedure, the server cannot process calls. Centigram recommends that you run this process during periods of low call traffic.

Step	*Reference*

1. Boot the system. (All modules boot to the Maintenance From Hard Disk Menu, since they are disabled.)

2. Initiate the floppy backup.

   Prompt: Enter one of the names:
   Response: **system.restore**

3. The server starts the process. Enter the number of backup diskettes to be restored.

   Prompt: How many backup floppies do you have?
   Response: Number of diskettes from the last floppy backup.

4. Insert diskette(s) when directed.

   Prompt: Insert Backup Diskette 1 in floppy drive
   Enter 'Y' when ready, or 'N' to quit:
   Response: Insert the diskette and enter Y to continue,
   N to abort the backup process.

5. Specify what information to restore.

   Prompt: Do you want to turn on the tutorial for each mailbox restored (Y/N)?
   Response: Y to restore the mailboxes with the tutorial activated,
   N to restore the mailboxes with the tutorial turned off.

   Prompt: Do you want to restore the configuration, security and billing information (Y/N)?
   Response: Y to restore the information,
   N to not restore the information.

Step	*Reference*

6. If you answered yes to restoring the configuration and billing information, specify the information to be restored; otherwise continue at step 8.

   Prompt: Enter 'Y' if you want to restore Billing rates file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore System name file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore System code file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore Banner file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore System Revision History:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore Remote console history file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore Remove console task commands file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore Current billing data file:
   Response: Y to restore the information,
   N to not restore the information.

   Prompt: Enter 'Y' if you want to restore VoiceMemo configuration file:
   Response: Y to restore the information,
   N to not restore the information.

Step	*Reference*

7. If you answered yes to restoring the VoiceMemo configuration file, specify which configuration is to be restored; otherwise continue at step 8.

   Prompt: `Enter 'Y' if you want to restore VoiceMemo configuration file 0:`
   Response: Y to restore configuration file 0,
   N to not restore configuration file 0.

   Prompt: `Enter 'Y' if you want to restore VoiceMemo configuration file 1:`
   Response: Y to restore configuration file 1,
   N to not restore configuration file 1.

8. Insert more diskettes as specified by the server.

   The server produces a report to the console when the restore is complete, then returns to the Maintenance From Hard Disk Menu.

Reload a System (system.reload)

This procedure describes how to install the software on an Model 120 or Model 70 using the System Reload program. This program should be used only on a non-redundant server that has experienced a disk failure, and only when you are instructed to use it. Performing this procedure deletes the existing database of all speech, accounts, and configuration. To update the server software and preserve the existing database of all speech, accounts, and configuration, use the Perform an Offline Software Update procedure (CP 6263).

Note: Make sure the Service Diskette, all Optional Feature Diskettes, and the Module Enable Diskette contain the serial numbers for the disk in the server and the disk to be added.

The Model 1201 and Model 70 contain an IDE hard disk, while the Model 120S contaians a SCSI hard disk. SCSI disk references have been replaced in the software where feasible.



WARNING!

The System Reload program erases all information currently on the hard disk. Run this program only if your technical support group instructs you to do so.



WARNING!

Be sure to shut down and disable the server using the process described in *CP 6268*.

Step	*Reference*

1. Insert the Floppy Boot Diskette. Press the reset button or turn on the system power. The system boots off the floppy drive. The server displays the self test results:

2. The server reads from the floppy disk, then requests the service diskette.

   Prompt: Insert floppy "SERVICE 6.00" and hit return
   Response: Insert the diskette, then press Enter.

3. The server reads from the floppy disk, and asks which process you want to execute.

   Prompt: Enter one of the names:
   Response: **system.reload**

Step *Reference*

4. The server reads from the floppy disk, and issues a warning about the pending process.

Prompt: WARNING! ! ********* INSTALL PROGRAM **********
INSTALL program should be executed only when a complete system installation
is desired (from scratch). This means that all information on the system
(accounts, speech, programs, etc.) will be lost. If you have a current
account backup diskette, the account data (but not speech) can be reloaded
via the system restore menu.

If this is not desired, then reboot the system and
execute the UPDATE program.

In order to do a complete INSTALL you must have as
a minimum the following set of diskettes:

SOFTWARE DISKETTES
PROMPTS DISKETTES

IF YOU DO NOT WANT TO CONTINUE, THEN RE-BOOT THE
SYSTEM! !! . . ..OTHERWISE
. . .ENTER A CARRIAGE RETURN

Response: Press Enter.

5. Enter the number of modules in the server.

Prompt: How many HOSTS are in this configuration?
Response: Enter the number of modules in the server.

Step *Reference*

6. The system displayed the installed disks and the current configuration. If the configuation is correct, continue with the reload.

Prompt:

```
* * *   I N S T A L L E D   D I S K S   * * *

              Disk 0
              ------
BUS 0       2049 MB

***   C O N F I G U R A T I O N   ***

                Drive 1
+-----------+---------+
|  Active       0:0   |
+-----------+---------+

(C) - CONTINUE                          ...
configuration is correct
(S) - SCAN all disks                    ... search for
installed disks
(X) - EXIT disk configuration           ... abort disk
configuration
Enter desired option (C/S/X/?):
```

Response: C to continue.

The server displays the following messages:

```
Configuring disk 0:0
Initializing virtual drives...
System hours increased
```

7. Confirm the configuration.

Prompt:

```
System Configuration
Number of Hosts
Hosts present
Number of disks
Active disk IDs
Redundant disk IDs
Enter Y to confirm the change:
```

Response: Review the information for accuracy.
Y if the information is correct,
N to reenter the information.

8. The server continues, then requests the first software diskette.

Prompt: When drive light goes out insert disk 1 and press return

Response: Insert the specified diskette, then press Enter.

Step	*Reference*

9. The server then requests the remaining diskettes. Insert the diskettes when prompted.

   Prompt: When drive light goes out insert disk 2 and press return
   Response: Insert the specified diskette then press Enter to continue.

10. After all the software diskettes have been loaded, load the prompts.

    Prompt: Do you want to install prompts to the system Y/N:
    Response: Y

11. Load the prompts diskettes.

    Prompt: Insert the 1st diskette containing the prompts and press return
    Response: Insert Prompts Disk 1 then press Enter to continue.

    Prompt: Wait until drive light is out, insert language disc #1, hit CR when ready.
    Response: Press Enter again to continue.

12. The prompts are copied to multiple hard disks, as applicable. The process can take many minutes, depending on the number of hard disks. The server then requests the remaining diskettes.

    Prompt: Working...
    Wait until drive light goes out, insert language disc #2, hit CR when ready.
    Response: Insert the specified diskette then press Enter to continue.

13. When the prompts are complete, the server displays the number of directory entries, pointer sectors, and speech blocks used for the server prompts.

    Prompt: For this prompt partition (vid 1):
    xxxx directory entries allocated out of xxxx available
    xxxx pointer sectors allocated out of xxxx available
    xxxx speech blocks allocated out of xxxxx available
    Starting up processes, please wait...

14. The server has an option for adding and RSD or patch:.

    Prompt: Do you want to install an RSD or Patch?
    Response: Enter Y to add an RSD or patch.
    Otherwise, press Enter.

Step | *Reference*

15. To complete the update process, you must load the Module Enable diskette and all the optional features.

    Prompt: Does the system have Optional Features?
    Response: **Y**

16. Load the Module Enable diskette or the optional feature.

    Prompt: Insert Optional Feature Setup diskette in the floppy drive
    Enter <carriage_return> when ready :
    Response: Insert the diskette, then press Enter.

17. The server loads the feature and asks if there are more.

    Prompt: XXX Optional Feature is now installed...
    Is there another Optional Feature in the system?
    Response: "XXX" represents the name of the optional feature.
    Enter **Y**, if there are more. Repeat steps 16 and 17 until the Module Enable diskette and all optional features have been loaded.
    Enter N, to end adding optional features and continue with the process.

18. If the server is a multi-module server, or contains a QNET card in Module 1, the following message is displayed. If the server is a single module, go to step 19.

    Prompt: WARNING: Do NOT reset this module.
    Press the reset button on all other modules, then carriage return.
    Response: Reset the specified modules and press Enter.

    The server waits for the other modules to boot before it continues.

    Prompt: Waiting for the other modules to boot up...
    Updating configuration...Please wait....

    Messages are displayed to the screen showing conversion of records, if any, and configuration information.

19. Press Enter to reboot and complete the update.

Shut Down a System

VoiceMemo Release 6.0A and later

This procedure describes how to shut down a module running Release 6.0. You should use this procedure before turning off the power to a Series 6 server module, as the shutdown command halts call processing in a clean and orderly fashion.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks. All SCSI references in this procedure are for SCSI servers only.



WARNING!

You should follow the policies of the site to warn users prior to the system shutdown. This process removes the server from call processing. Centigram recommends that you perform this procedure only during periods of low call traffic.

Step	*Reference*
1. Reach the System Maintenance Menu.	Menu Map 1
2. Execute a shutdown command. Select: (S) System Shutdown • The server displays the status of each line and the lengths of the message indicator request queues. *Prompt:* WARNING!! This will terminate call processing. Type "shutdown" if you really want to do this. *Response:* shutdown	
3. Specify which modules to shut down. *Prompt:* modules to shutdown: *Response:* a • The server displays the status of each line of the specified modules as "idle," "active" or "stopped," and updates the status every minute until all lines are stopped. The server stops any calls still in progress after five minutes.	
4. If you are executing a *system* shutdown, wait for the message waiting queue to clear. If you are executing a *module* shutdown on a multi-module system, do not wait for the message waiting queue to clear. *Prompt:* Wait for message waiting queues to be empty?	

Step	*Reference*

Response: Y to wait for the queue to clear,
N to continue immediately with the shutdown.

5. When the Series 6 server has taken all lines of the specified modules off-hook, it continues by asking if a verify is to be executed.

   Prompt: Perform Offline System Verification? (Y/N):
   Response: Y to execute the verify,
   N to skip verify and continue with the shut down.

6. Specify if changes to the status of each module are to be made.

   Prompt: Enable or Disable Modules?
   Response: Y to change rhe status of modules,
   N to keep the module status the same and continue at step 11.

7. If you answered yes in step 6, a chart with the status of each module is displayed and then the Module Maintenance Menu is displayed.

8. To Enable a module:

   Select: (E) ENABLE a module
   Prompt: Which Module?
   Response: The number of the module. (Enter 1 or a for Model 1 20 or Model 70.)

9. To Disable a module:

   Select: (D) DISABLE a module
   Prompt: Which Module?
   Response: The number of the module. (Enter 1 or a for Model 1 20 or Model 70.)

   Prompt: type "disable" to confirm your request:
   Response: disable

   If you disable this module you will not see the balance of this procedure because the module will reset. The console then resets to the Maintenance From Hard Disk Menu.

10. When you finish configuring the modules, exit the menu.

11. The server completes the shutdown.

    Prompt: ****SHUTDOWN COMPLETE****

    The System Maintenance Menu is displayed. You can now either reboot the module or remove power to the module.

Redundant Disk Addition (make.redundant)

VoiceMemo Release 6.0A and later

This procedure describes how to add storage redundancy by adding another disk to a non-redundant Centigram Series 6 server. The new disk is called the redundant disk and stores a mirror image of all data on the primary (original) disk. This procedure can be performed while the server is online. For instructions describing how to increase the storage capacity to a server by adding another primary disk, see CP 6282, Disk Addition (add.disk).

FOR THE MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 servers. In such cases, shaded areas indicate a difference in operations for the Model 70. The Model 70 is equivalent to a "one module" server. When asked for the number of the host or module, always enter "1" or "a".

All SCSI references in this procedure are for SCSI servers only.

Note: You can find TRs referenced in this procedure in the *Centigram Series 6 Technical Reference* Manual.

Step	*Reference*

Introduction

Primary drives in the Series 6 server store configuration data and voice message information. Configuration data can be preserved by doing frequent backups. However, voice message information is so transitory that it is not possible to backup the disks with enough frequency to maintain their integrity. To preserve the integrity of voice messages, a different method must be used.

The Series 6 server allows the customer to install mirror drives to provide redundancy of primary drives. The program to add a redundant disk is called "Make Redundant." There are two methods for accessing the Make Redundant program:

1. From the Hardware Configuration Menu
2. From the Floppy Boot and Service Diskettes

This procedure describes both methods. Centigram recommends running the Make Redundant program from the Hardware Configuration Menu. Both procedures prevent the system from processing calls during the upgrade. Before you implement the upgrade, please follow these guidelines:

- Check that the serial numbers imprinted on the labels of the Service Diskette and the Optional Feature Diskette coincide with the serial numbers of the primary disk and the disk that you are adding.

  Note: Centigram recommends that you check all other system diskettes to ensure that their serial numbers match.

Step	*Reference*
Prepare the New Disk	
1. Determine how to jumper the new hard disk as an IDE "slave" disk.	TR 1923
2. Jumper the new hard disk. If there are two hard disks in one server, one must be configured as master and the other must be configured as slave. If there is one hard disk in the server, it must be configured as master. IDE hard disks are shipped from Centigram configured as master.	TR 1923
Prepare the System	
3. Reach the Hard Disk Utilities Menu, then go to the SCSI Status Menu.	Menu Map 8
4. Verify that all disks are in sync. Select: (D) Display Status of all SCSI Buses and disks. *Response:* Server displays a report showing the status of the disk(s). Verify that the disk(s) show the status as ENA. Press Enter to exit.	
5. If any disk is out of sync with its redundant mate, update the redundancy.	CP 7015
6. Execute a system shutdown. Change the status of the modules based on which program you are using: - If running from the Hardware Configuration Menu, leave all modules enabled.	*CI? 6268*
Install the Disk	
7. Turn off the system power and remove the server cabinet.	CP *6224,* Ch. 4
8. Change the hardware, adding the new disk.	CP 6221, Ch. 4
9. If you are running the Add A Redundant Disk program from the Hardware Configuration Menu, go to step 10. If you are running the Add A Redundant Disk program from the Floppy Boot and Service Diskettes, go to step 14.	

Step	*Reference*

Run the Make Redundant Program From the Hardware Configuration Menu

10. Turn on the power to the system, and boot from the hard disk.

11. Reach the VoiceMemo Hardware Configuration Menu, then to go the Disk Configuration Menu. — Menu Map 12

12. Add the redundant disk.

    Select: (M) Make a Disk Redundant

    Prompt: `Please insert service diskette3 into floppy drive, hit <RETURN> when ready`

    Response: Insert the Service Diskette, and press Enter.

    Prompt:
    ```
    Active Disk:
    Specify one of the following bus:diskId pairs:
    n:n  n:n
    Which disk?
    ```

    Response: Where "n" represents the valid disk IDs.
    Enter the diskI ID of the primary disk that the new redundant disk is attached to.

    Prompt:
    ```
    Redundant Disk:
    Specify one of the following bus:diskId pairs
    n:n  n:n
    Which disk?
    ```

    Response: Where "n" represents the valid disk IDs.
    Enter the disk ID of the redundant (mirror-image) disk.

13. Update redundancy of all out of sync disks. — CP 7015

    This completes the Add A Redundant Disk program from the Hardware Configuration Menu.

Run the Make Redundant Program From the Floppy Boot and Service Diskettes

14. Insert the Floppy Boot Diskette. Turn on the system power and boot from the diskette. The server displays the self test results.

15. The server reads from the diskette, then requests the service diskette.

    Prompt: `Insert floppy "SERVICE 6.00" and hit return`

    Response: Insert the diskette, and press Enter.

Step *Reference*

16. The server reads from the diskette, and asks which process you want to execute.

Prompt: Enter one of the names:
Response: **make.redundant**

17. The server reads from the diskette, and issues a warning about the pending process.

Prompt: *****WARNING: REDUNDANT PROGRAM*******
REDUNDANT program is used to make a primary disk have a mirror-image secondary disk. Any data on the primary disk will also be recorded on the secondary disk. You must have the Redundancy Extra Cost Option installed to use this feature.

____ WARNING----
YOU MUST DISABLE ALL THE OTHER HOSTS TO USE THIS OPTION. IF YOU HAVE NOT DONE SO, REBOOT THIS HOST AND DO IT NOW !!!

IF YOU DO NOT WANT TO CONTINUE, THEN RE-BOOT THE SYSTEM!! . ..OTHERWISE
... ENTER A CARRIAGE RETURN.

Response: Press Enter.

The "Warning" is for a server currently running Release 6.00, since most servers running these versions can run the Make Redundant program online. If you do the procedure from the Floppy Boot Diskette, you must disable all modules.

18. Identify the disks to be made a redundant pair.

Prompt: Please specify the PRIMARY disk: Enter the disk id (path:target), <cr> to stop, or ? for help:
Response: Enter the disk ID of the primary disk that the new redundant disk is attached to.

Prompt: Now specify the REDUNDANT disk: Enter the disk id (path:target), <cr> to stop, or ? for help:
Response: The disk ID of the redundant (mirror-image) disk.

The server configures the disk and repeats the prompt asking for another primary disk ID. Continue entering the ID numbers until all the new disk pairs have been configured, then press Enter to exit.

Step	*Reference*
19. Acknowledge the end of the process. *Prompt* BUILD REDUNDANT DISK DONE. ENTER A CARRIAGE RETURN TO REBOOT THE SYSTEM *Response:* Press Enter.	
20. Reach the System Maintenance Menu, then go to the Module Maintenance Menu.	Menu Map 12
2 1. Update the redundancy of the new disk and all other disks that were affected by the shutdown.	CP 7015

Disk Addition (add.disk)

This procedure describes how to increase the storage capacity by adding a primary disk to a Centigram Series 6 server. This procedure can be performed while the server is online. For instructions describing how to add storage redundancy to a server by adding a single redundant disk, see CP 628 1 Redundant Disk Addition (make.redundant).

FOR THE MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 servers. In such cases, shaded areas indicate a difference in operations for the Model 70. The Model 70 is equivalent to a "one module" server. When asked for the number of the host or module, always enter "1" or "a".

All SCSI references in this procedure are for SCSI servers only.

Note: You can find TRs referenced in this procedure in the *Centigram Series* 6 Technical *Reference* Manual.

Step	*Reference*

Introduction

The Series 6 server allows the customer to expand the number of message storage hours to meet the expanding needs of users. This is done by either adding disk capacity or adding disk drives ("disks") to the server. The program to add a disk is called "Add Disk." There are two methods for accessing the Add Disk program:

1. From the Hardware Configuration Menu
2. From the Floppy Boot and Service Diskettes

This procedure describes both methods. Centigram recommends running the Add Disk program from the Hardware Configuration Menu. Both procedures prevent the server from processing calls during the upgrade. Before you implement the upgrade, please follow these guidelines:

- Check that the serial numbers imprinted on the labels of the Service Diskette and the Optional Feature Diskette coincide with the serial numbers of the primary disk and the redundant disk that you are adding.

  Note: Centigram recommends that you check all other system diskettes to ensure that their serial numbers match.

Step	*Reference*
Prepare the New Disk	
1. Determine how to jumper the new hard disk as an IDE "slave" disk.	TR 1923
2. Jumper the new hard disk. If there are two hard disks in one server, one must be configured as master and the other must be configured as slave. If there is one hard disk in the server, it must be configured as master. IDE hard disks are shipped from Centigram configured as master.	I-R 1923
Prepare the System	
3. Reach the Hard Disk Utilities Menu, then go to the SCSI Status Menu.	Menu Map 8
4. Verify that all disks are in sync. *Select:* (D) Display Status of all SCSI Buses and disks. *Response:* Server displays a report showing the status of all disks. Verify that all disks show the status as ENA. Press Enter to exit.	
5. If any disk is out of sync with its redundant mate, update the redundancy.	CP 7015
6. Execute a system shutdown. Change the status of the modules based on which program you are using: • If running from the Hardware Configuration Menu, leave all modules enabled.	CP 6268
Install the Disk	
7. Turn off the system power and remove the server cabinet.	CP 6224, Ch. 4
8. Change the hardware, adding the new disk.	CP 6221, Ch. 4
9. If you are running the Add Disk program from the Hardware Configuration Menu, go to step 10. If you are running the Add Disk program from the Floppy Boot and Service Diskettes, go to step 15.	

Step | *Reference*

Run the Add Disk Program From the Hardware Configuration Menu

10. Turn on the power to the system, and boot from the hard disk.

11. Reach the VoiceMemo Hardware Configuration Menu, then to go the Disk Configuration Menu. — Menu Map 12

12. Add the disk.

Select: (A) Add a single disk

Prompt: Please insert service diskette into floppy drive, hit <RETURN> when ready

Response: Insert the Service Diskette, and press Enter.

Prompt: Specify one of the following bus:diskId pairs:
n:n n:n
Which disk?

Response: Where "n" represents the valid disk IDs.
Enter the two-digit disk ID.

Prompt:

	Software	Prompts	Speech (Messages)	Accounts (Mailboxes etc.)
Configuration 1:	Yes	Yes	XX Hours	XXXX Account Records
Configuration 2:	No	No	XX Hours	XXXX Account Records

Please select the desired CONFIGURATION TYPE for disk n:n (1 or 2):

Response: Enter the desired configuration type.

13. Add the redundant disks, if the server is to contain any. — CP 8281

14. Increase the system hours. — CP 7021, Ch. 3

This completes the Add Disk program from the Hardware Configuration Menu.

Run the Add Disk Program From the Floppy Boot and Service Diskettes

15. Insert the Floppy Boot Diskette. Turn on the system power and boot from the diskette. The server displays the self test results.

16. The server only allows 4 seconds for the "f" to be entered. If the server did not accept the "f," press the reset button on only the module you are working on, and try again. When the server accepts the "f," select the service option.

Prompt: Enter one of the names:
Response: *service*

Step	*Reference*

17. The server reads from the diskette, then requests the service diskette.

    Prompt: Insert floppy "SERVICE 6.00" and hit return
    Response: Insert the diskette, and press Enter.

18. The server reads from the diskette, and asks which process you want to execute.

    Prompt: Enter one of the names:
    Response: **add.disk**

19. The server reads from the diskette, and issues a warning about the pending process.

    Prompt: *****WARNING: ADD-DISK PROGRAM*******
    ADD.DISK program should be run only when increasing the amount of disk storage by adding a new disk. Any data on the added disk will be destroyed in the process. The disk being added WILL NOT be used for speech storage until you upgrade the service hours.

    ---- WARNING ----
    YOU MUST DISABLE ALL THE OTHER HOSTS TO USE THIS OPTION. IF YOU HAVE NOT DONE SO, REBOOT THIS HOST AND DO IT NOW !!!

    IF YOU DO NOT WANT TO CONTINUE, THEN REBOOT THE SYSTEM. . ..OTHERWISE
    ... ENTER A CARRIAGE RETURN.
    Response: Press Enter.

The "Warning" is for a server currently running Release *6.00,* since most servers running these versions can run the add disk program online. If you perform the procedure from the Floppy Boot Diskette, you must disable all modules.

Step	Reference

20. Add the active (or primary) disk.

Prompt: Which disk do you want to add?
Enter the disk id (path:target), <cr> to stop,
or ? for help:

	Software	Prompts	Speech (Messages)	Accounts (Mailboxes etc.)
Configuration 1:	Yes	Yes	XX Hours	XXXX Account Records
Configuration 2:	No	NO	XX Hours	XXXX Account Records

Please select the desired CONFIGURATION TYPE
for disk n:n (1 or 2):

Response: Enter the desired configuration type.

21. Add the redundant disks, if any.

Prompt: Do you want this disk to have a redundant disk? (Y/N)

Response: *Y* if the disk is to have a redundant disk,
N to skip the redundant disk process and continue at step 24.

22. If adding redundant disk(s), identify the redundant disk ID.

Prompt: Now specify the REDUNDANT disk:
Enter the disk id (path:target), <cr> to stop,
or ? for help:

Response: The two-digit disk ID of redundant disk to added.

23. The server configures the disk and repeats the prompt asking for another disk ID. Continue entering the disk ID numbers until all the redundant disks have been added, then press Enter to exit.

24. Acknowledge the end of the process.

Prompt: ADD-DISK DONE. ENTER A CARRIAGE RETURN TO REBOOT THE SYSTEM.

Response: Press Enter.

The server resets all modules to the Maintenance from Hard Disk Menu.

25. Reach the System Maintenance Menu, then go to the Module Maintenance Menu. — Menu Map 12

26. Update the redundancy of all disks that were affected by the shutdown. — CP 7015

Online Disk Replacement (Redundant Systems)

VoiceMemo Release 6.0A and later

This procedure describes how to replace a hard disk for a single or multi-module server with full disk redundancy. This procedure can be performed while the server is online.

FOR THE MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 70. The Model 70 is equivalent to a "one module" server. When asked for the number of the host or module, always enter "1" or "a".

All SCSI references in this procedure are for SCSI servers only.

Note: Be sure that the Service Diskette, all Optional Feature Diskette(s), and the Module Enable Diskette contain the serial numbers for all disk(s) in the server and the disk(s) to be added.



CAUTION!

If your server is a multi-module server without redundant disks that has experienced a total hard disk failure, contact the Technical Assistance Center for instructions on how to set up the hardware.



WARNING!

During this procedure, the server cannot process calls. Centigram recommends that you perform this procedure during periods of low call traffic.

Note: You can find TRs referenced in this procedure in the *Centigram* Series 6 *Technical Reference Manual.*

Step	*Reference*
Prepare the New Disk	
1. Jumper the new disk to match the master or slave disk to be replaced.	TR 1923
2. Call the Technical Assistance Center to add the serial number of the new disk to the Service Diskette, the Module Enable Diskette, and all Optional Feature Diskette(s), if the server contains any. This can be done while the server is processing calls.	
Prepare the System	
3. Reach the Hard Disk Utilities Menu, then go to the SCSI Status Menu.	Menu Map 8

Step	*Reference*
4. Verify that all disks are in sync. Select: (D) Display Status of all SCSI buses and disks. Response: Server displays a report showing the status of all disks. Verify that all disks show the status as ENA. Press Enter to exit.	
5. If any disk, other than the disk to be replaced, is out of sync with its redundant mate, update the redundancy. Do not update the redundancy of the disk to be replaced.	CP 7015
6. Shut down the system. Leave the status of all modules enabled.	CP 6268
7. Turn off the system power.	
8. Change the hardware, removing the disk to be replaced.	CP 6221, Ch. 4
9. Install the new hard disk and replace the cabinet cover.	CP 6224, Ch. 4
10. Turn on the system power.	
11. Reach the VoiceMemo Hardware Configuration Menu, then go to the Disk Configuration Menu.	Menu Map 12
12. Replace the disk. Select: (S) Replace a disk of redundant pairs *Prompt:* Please insert service diskette into floppy drive, hit <RETURN> when ready. *Response:* Insert the diskette and press Enter. *Prompt:* Specify one of the following bus:Id pairs: n:n n:n Which Disk? Response: n:n represents the two digit disk IDs of the disks installed in the server available to be replaced. Enter the two **digit** disk ID of the disk to be replaced. The server configures the disk. When the process is complete, the server prompts with the serial number of the new disk. *Prompt:* Serial number is xxxx.	
13. Update the redundancy of the new disk.	CP 7015

Offline Disk Replacement (Non-Redundant/Redundant Systems)

This procedure describes how to replace a defective or malfunctioning hard disk with a new hard disk in a non-redundant or redundant Centigram Series 6 server. This procedure must be performed while the server is offline. (Although this procedure can be used for redundant systems, Centigram recommends CP 6283, Online Disk Replacement (Redundant Systems) for redundant disk replacement.)

This procedure requires that all data be transferred from the existing disk to the new replacement disk. To accomplish this, you must reconfigure the existing hard disk as the *slave* disk and configure the new disk as the master disk. This conversion transfers all information from the existing hard disk to the new hard disk and maintains a one-to-one correspondence between the slave and master.

Be sure the Service Diskette, all Optional Feature Diskettes, and the Module Enable Diskette contain the serial numbers for the disk in the server and the disk to be added.

Note: The Model 70 is equivalent to a one-module server. System prompts for the Model 70 can contain generic software references to hosts or modules.



WARNING!

During this procedure, the server cannot process calls. Centigram recommends that you perform this procedure during periods of low call traffic.

Note: You can find TRs referenced in this procedure in the *Centigram Series 6 Technical Reference Manual.*

Step	*Reference*

Inventory the Conversion Parts

1. The items listed below are required to complete the conversion process. Do not begin the conversion unless you have all of the items.
   - Release 6.0A or later, already installed on the existing hard disk in your server
   - A Floppy Boot Diskette
   - A new hard disk. This hard disk must be formatted by Centigram.
   - A new Service Diskette serialized for the new hard disk.

Prepare the System

2. Call your technical support group for assistance in adding the serial number of the new hard disk to the Service Diskette, the Module Enable Diskette, and all Optional Feature Diskette(s), if the server contains any. You can do this while the server is processing calls.

Step	*Reference*
3. Run an Online System Verify.	CP 7001
4. Perform a floppy backup.	CP 5703
5. Shut down the system.	CP 6268
6. Turn off the system power.	
Set Up the Hardware	
7. Remove cabinet cover.	CP 6224
8. Disconnect the disk cable from the existing hard disk and remove it from the cabinet.	CP 6221
9. Rejumper the existing (defective or malfunctioning) hard disk from master to slave.	TR 1923
10. Reconnect the disk cable to slave hard disk. Do not reinstall the hard disk.	
11. Jumper the new hard disk to master, if required. IDE hard disks are shipped from Centigram configured as master.	TR 1923
12. Attach the second connector on the disk cable to the new master hard disk. (If a second primary hard disk is already connected to this cable connector, temporarily remove it until the master/slave data transfer process is complete. Do not connect the new master hard disk to a third connector.)	
Run the Disk Replacement Program	
Note: In general, you should never operate the Model 70 with the cover removed. This is an exception. Proceed with caution.	
13. Insert the Floppy Boot Diskette. Turn on the system power and boot from the diskette.	
14. When prompted, select the option to change the CMOS configuration.	
15. Once in the CMOS set up, go to the entry for Hard Disk 1 and set the parameters to correspond to the new hard disk which you are installing as the new master hard disk.	
16. Go to the entry for Hard Disk 2 and set the parameters to correspond to the existing hard disk. You have just reconfigured the existing hard disk. It was the master hard disk, now it is the slave hard disk.	
17. Save these changes by pressing the **Esc** key and then the F4 key.	
18. The server boots from the floppy disk drive, displaying the Copyright and the Revision history. It prompts you to select from two options: "floppy or service."	
19. Select the **"service"** option. The server then asks for the Service Diskette 6.0.	

Step | *Reference*

20. Insert the Service Diskette and press Enter. From the menu of options, select REPLACE.DISK.

21. The server displays a warning message. This is your prompt to verify that both hard disks are correctly connected and that you did a floppy backup before you started this procedure. If you failed to complete these requirements, stop the procedure at this point and complete them.

Prompt:
```
WARNING! !******* REPLACE PROGRAM*******
REPLACE program should be run only when
you want to replace a SCSI disk
with a new SCSI disk. You must TEMPORARILY
set the SCSI id of the
destination disk to be an id not.used by
any other SCSI device. If all
ids are being used then please power
down the system, TEMPORARILY
substitute for the new disk any existing
disk which is not the disk to be
replaced or its mirror disk, and then start
this process again.

------ WARNING------
YOU MUST DISABLE ALL THE OTHER HOSTS TO BE
ABLE TO USE THIS OPTION. IF YOU HAVE NOT DONE
SO, REBOOT THIS HOST AND DO IT NOW.

IF YOU DO NOT WANT TO CONTINUE, THEN RE-BOOT
THE SYSTEM!! .OTHERWISE
... ENTER A CARRIAGE RETURN
```

Response: Press Enter.

22. Identify the replacement disks.

Prompt:
```
Which disk do you want to replace?
Enter the disk id (path:target), <cr> to stop, or ?
for help.
```

Response: Enter the SCSI ID of the disk to be replaced.

Prompt:
```
Which disk is the new disk?
Enter the disk id (path:target), <cr> to stop, or ?
for help.
```

Response: Enter *the* SCSI ID of the new disk

23. If the hard disks have not been prepared properly, the following error message is displayed:

Prompt:
```
MOUNT: Unable to find partition
```

If this happens, check the cables to the hard disks, and try the disk conversion again. If there is still a problem, contact your Distributor.

Step	Reference

24. The server takes approximately 45 minutes complete the process. The server displays the following message when the replace disk is done:

Prompt:

```
**************************************************
* Set hard disk parameters by selecting option S *
* from the HARD DISK UTILITIES MENU after system *
* reboot.                                        *
* Please shutdown system and adjust disk 1:1     *
* to disk 1:2, then reboot. If needed, update *
* redundancy by updating disk 1:2 from its mirror *
* image disk by selecting option K from the HARD *
* DISK UTILITIES MENU
**************************************************

Specified disk replaced.

System Configuration
--------------------
Number of Hosts
Hosts present
Number of disks
Active disk IDs
Redundant disk IDs
Configuration has been changed!
```

Response: Turn off the power to the system.

Remove the Old Disk

25. Detach the connectors from both hard disks,

26. Install the new hard disk. Prepare the old hard disk for return and/or repair. (If required, reconnect the second primary hard disk to the second disk cable connector and resinstall.) — CP 6221

Return the System To Normal Operation

27. Turn on the system power.

28. Run an Online System Verify. — cl? 7001

29. Reinstall cabinet cover. — Cl? 6224

30. Complete your post-implementation documentation.

Name the Configurations

VoiceMemo Release 6.0A and later

This procedures describes how to name the two system configurations. Use descriptive names to help you remember the differences between the two configurations.

Step	*Reference*
1. Reach the VoiceMemo Configuration Main Menu, then go to the VoiceMemo Active Configuration Menu.	Menu Map 12
2. Name the configuration. Select: (N) Name Configurations *Prompt:* Enter the configuration number to name (CR for no change) : *Response:* Number (0 or 1) of the configuration to create or modify name for. *Prompt:* Enter a name for this configuration, or <cr> for default or existing name. The name can be up to 24 characters long. Name : *Response:* Enter a name that describes the configuration.	
3. Repeat step 2 to create or modify the name for the other configuration.	

View the Configuration Names

VoiceMemo Release 6.0A and later

This procedures describes how to view the names of the two system configurations.

Step	*Reference*
1. Reach the VoiceMemo Configuration Main Menu, then go to the VoiceMemo Active Configuration Menu.	Menu Map 12
2. View the report. Select: (V) View Configurations *Prompt:* Configuration last modified by OFFLINE CONFIGURATION is n. Where *n* is the number of the configuration. The system displays the report and returns to the command line.	

Enable a Module

VoiceMemo Release 6.0A and later

This procedure describes how to enable a module to return it to normal call processing operation. When changing the status of multiple modules, always change the one the console is attached to last.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the Module Maintenance Menu.	Menu Map 12
2. Enable the module. *Select:* (E) ENABLE a module *Prompt:* Input a module id in the following range: n n n n Which Module? *Response:* Enter the number of the module to be enabled. (Enter 1 or a for Model 120 or Model 70.)	
The specified module automatically resets itself and returns to normal operation.	

Update Disk Redundancy

VoiceMemo Release 6.0A and later

This procedure describes how to update the disk redundancy. Each hard disk is partitioned into multiple logical drives. To make sure all drive partitions are updated, use the "Update all out of synchronization hard disks" option.

Note: The server allows you to watch the number of the sector number being updated, but this display slows the verification process.

Use the following table to determine which types of drives should be updated.

Status:	Drives to be updated:
ENA	Drives are not out of synchronization.
OUTSYN	Software; speech and accounts
OUTDAT	Speech and accounts
OUTSFW	Software

Step	*Reference*
1. Reach the Hard Disk Utilities Menu, then go to the Redundancy Update Menu.	Menu Map 8
2. Update the redundancy. • If multiple drives are out of synchronization, update the redundancy of all drives using the "Update all out of synchronization hard disks" option. Select: (A) Update all out of synchronization hard disks *Prompt:* Type "update" to confirm your request: *Response:* update **Note:** Any drive listed as ENA is not updated. • To update a specific disk use: *Select:* (Q) Update system software drives or *Select:* (S) Update speech and account drives on a hard disk.	
3. Reach the Hard Disk Utilities Menu, then go to the SCSI Status Menu.	Menu Map 8
4. Verify that all disks are in sync. *Select:* (D) Display Status of all SCSI Buses and disks. *Response:* Server displays a report showing the status of all disks. Verify that all disks show the status as ENA. Press Enter to exit. A note and timestamp are recorded in the logfile as each disk is placed back in service.	

Shut Down a Hard Disk

VoiceMemo Release 6.0A and later

This procedure describes how to shut down a hard disk, removing it from service. This process requires the server to contain redundant disks.

Step	*Reference*
1. Reach the Hard Disk Utilities Menu, then go to the SCSI Status Menu.	Menu Map 8

2. Shut down the disk.

   Select: (S) Shutdown SCSI BUS or disk
   Prompt: SCSI Shutdown Menu

   Select: (D) Shutdown a SCSI disk
   Prompt: Input a disk in the following range:
   nn nn nn
   Which Disk?
   Response: Enter the two-digit SCSI ID of the disk to be shut down.

   Prompt: type "disable" to confirm your request:
   Response: disable

3. Verify the desired disk has been shut down.

   Prompt: SCSI Shutdown Menu
   Response: X

   Select: (D) Display Status of all SCSI Buses and disks
   Response: Server displays a report showing status of all disks. Verify the disk is listed as DIS (disabled). Press Enter to exit the report and X to exit the menu.

Enable a Hard Disk

The procedure describes how to enable a disk. This process requires the server to contain redundant disks.

The Update Redundancy procedure described in CP 70 15 must be run before the disk is available for the server to use.

FOR THE MODEL 120 AND MODEL 70 ONLY: Some system prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. In such cases, shaded areas indicate a difference in operations for the Model 120 and Model 70. The Model 120 and Model 70 models are equivalent to or "one module" servers. When asked for the number of the host or module, always enter "1" or "a".

This procedure applies to servers using either SCSI or IDE hard disks.

Step	*Reference*
1. Reach the Hard Disk Utilities Menu, then go to the SCSI Status Menu.	Menu Map 8

2. Enable the disk.

Select: (E) Enable SCSI BUS or disk
Prompt: SCSI Enable Menu

Select: (D) Enable a SCSI disk
Prompt: Select one of the following disks:
0:0 0:1
Which Disk [bus:scsiId]?
Response: Enter the two-digit SCSI ID of the disk to be enabled.

3. Verify the desired disk has been enabled.

Prompt: SCSI Enable Menu
Response: X

Select: (D) Display Status of all SCSI Buses and disks
Response: Server displays a report showing status of all disks. Verify the disk is listed as ENA, OUTSYN, OUTDAT or OUTSFW.

Add or Cancel a Phoneline Exception

VoiceMemo Relase 6.0A and later

This procedure contains instructions for setting any phoneline exception. Phoneline exception changes take effect on the next new call after saving the settings. A table for converting port numbers to line numbers follows the procedure.

Step	*Reference*

Add a Phoneline Exception

1. Reach the Phoneline Exceptions Menu. — Menu Map 10
2. Select line to change.

   Select: (A) Add exception
   Prompt: Keep entering triplets, then enter <CR> on a line by itself.
   line triplets to change:
   Response: The line triplets to change (module number:line card number:port number). Press Enter when ou are finished entering triplets.

3. Select the exception number to set.

   Prompt: command =
   Response: The **phonline** exception number.

4. Enter the new value for the exception.

   Prompt: value =
   Response: The desired new value.

5. Repeat steps 3 and 4 until all the phoneline exceptions for the selected line are set. When you are finished, press Enter.
6. Select a new line to change or press Enter to finish.

Cancel a Phoneline Exception

1. To return a phoneline exception to the default value, reach the Phoneline Exceptions Menu. — Menu Map 10
2. Select a line to change.

   Select: (C) Cancel exception.
   Prompt: Keep entering triplets, then enter <CR> on a line by itself.
   line triplets to change:
   Response: The line triplets to change (module number:line card number:port number). Press Enter when ou are finished entering triplets.

Step	*Reference*

3. Select the phoneline exception to reset.

   Prompt: command to cancel =
   Response: The number of the phoneline exception to reset

4. Repeat steps 8 and 9 for each phoneline exception you want to change. When you are finished, press Enter.

5. Enter the next line to be changed, or press Enter to exit.

Activate New Software

VoiceMemo Release 6.0A and later

This procedure describes how to activate new software loaded via the Online Software Update program.



WARNING!

This procedure resets the server, causing loss of call processing capabilities. Centigram recommends that this process be completed during periods of low call traffic.

Step	*Reference*
1. Reach the System Maintenance Menu, go to the System Maintenance Additional Options Menu, then select S to go to the Online Software Update Menu.	Menu Map 12

2. Activate the software.

Select: (A) Activate New Software

Prompt: Activating software will cause the system to shutdown and reboot automatically. If you wish to activate the new software and reboot the system type "activate".

Response: activate

Prompt: Disk 1 has new software Release 6.00...
This software was updated on...

Do you want to continue. Enter 'Y' to continue, 'N' to stop:

Response: Y to continue the process,
N to abort the process

Prompt: Perform shutdown?

Response: Y to warn the users of the impending shutdown,
N to skip the warning.

Prompt: Wait for Message Waiting?

Response: Y to wait for the message waiting queue to clear.

The server automatically shuts down and resets the entire system. Phase II of the software update is run, and the server resets a second time, returning to the VoiceMemo Configuration Main Menu.

Diagnose a Disk With System Online

VoiceMemo Release 6.0A and later

This procedure describes how to run the diagnose program to check the hard disk while the system is online processing calls.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the Hard Disk Utilities Menu.	Menu Map 8

2. Specify the disk(s) to be tested.

   Select: (D) Diagnose a disk

   Prompt: `Enter the hard disk id[bus:scsiId] to test, or A for all, or Q to quit:`

   Response: Enter a if you want to test all the disks in the system, otherwise enter the bus and two-digit SCSI ID number of the disk to be tested.

3. Identify which tests are to be executed.

   Prompt: `All options default to 'Y': Perform Controller Test? [Y/N]`

   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt `Perform Sequential Test? [Y/N]`

   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: `Perform Random Seek Test? [Y/N]`

   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: `Perform Spiral Seek Test? [Y/N]`

   Response: Y or press Enter to perform the test,
   N to skip the test.

4. If any test does not pass, contact your Centigram Distributor or Centigram TAC.

Run Diagnose From Hard Disk

VoiceMemo Release 6.0A and later

This procedure describes how to run the hard disk diagnose program from the Maintenance From Hard Disk Menu.

It is assumed the module running the test has been shut down and disabled using the process described in Cl? 6268.



WARNING!

This version of the diagnose program requires one module to be removed from normal operation. Centigram recommends that this process be run during periods of low call traffic. If possible, the online version of this program should be run from the Hard Disk Utilities Menu so there is not a loss of call processing capabilities. See CP 7029 for the online instructions.

Step	*Reference*

1. Boot the module to the Maintenance From Hard Drive Menu.

   Prompt: Run MAINTENANCE from Hard Drive?
   Response: *y*

2. Start the Diagnose program and identify the disk(s) to be tested.

   Select: diagnose
   Prompt: Enter the hard disk `id[bus:scsiId]` to test, or A for all, or Q to quit:
   Response: a if you want to test all the disks in the system, otherwise enter the bus and two-digit SCSI ID numbers, separated by a colon, of the disk to be tested.

Step	*Reference*

3. Identify which tests are to be executed.

   Prompt: All options default to 'Y':
   Perform Controller Test? [Y/N]
   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: Perform Sequential Test? Y/N]
   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: Perform Random Seek Test? [Y/N]
   'Response: Yor press Enter to perform the test,
   N to skip the test.

   Prompt: Perform Spiral Seek Test? [Y/N]
   Response: Yor press Enter to perform the test,
   N to skip the test.

4. If any test does not pass, contact your Centigram Distributor or Centigram TAC.

5. If all tests pass, enable the module being tested.

   Select: host.status
   Prompt: Module Status Menu

   Select: (E) ENABLE a module
   Prompt: Input a module id in the following range:
   n n n n
   Which Module?
   Response: Enter the number(s) of the module(s) to enable.

   The module(s) automatically resets and returns to normal operation.

Run Diagnose From Diskette

VoiceMemo Release 6.0A and later

This procedure describes how to run the hard disk diagnose program from the Diagnostic Diskette.

It is assumed the system has been shut down and all modules disabled using the process described in CP 6268.



WARNING!

This version of the diagnose program requires the system to be removed from normal operation. Centigram recommends that this process be run during periods of low call traffic. If possible, you should run the online version of this program from the Hard Disk Utilities Menu, so you do not lose processing capabilities. See CP 7029 for the online instructions.

Step	*Reference*

1. Insert the Diagnostic Diskette in the floppy drive and reset the server.
2. Start the server from the hard disk, then run commands from the floppy diskette.

   Prompt: `IPL100: Boot system from (Hard disk, Floppy) [H/F]?`
   Response: Press Enter.

   Prompt: `Run commands from floppy?`
   Response: **Y**
3. The server reads from the floppy disk and asks which process is to be executed.

   Prompt: `Enter one of the names:`
   Response: *diagnose*
4. Identify the disk(s) to be tested.

   Prompt: `Enter the hard disk id[bus:scsiId] to test, or A for all, or Q to quit:`
   Response: a if you want to test all the disks in the system, otherwise enter the bus and two-digit SCSI ID numbers, separated by a colon, of the disk to be tested.

step	*Reference*

5. Identify which tests are to be executed.

   Prompt: All options default to *'Y':*
   Perform Controller Test? *[Y/N]*
   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: Perform Sequential Test? [Y/N]
   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: Perform Random Seek Test? [Y/N]
   Response: Y or press Enter to perform the test,
   N to skip the test.

   Prompt: Perform Spiral Seek Test? [Y/N]
   Response: Y or press Enter to perform the test,
   N to skip the test.

6. If any test does not pass, contact your Centigram Distributor or Centigram TAC.

7. If all tests pass, enable the modules.

   Select: host.status
   Prompt: Module Status Menu

   Select: (E) ENABLE a module
   Prompt: Input a module id in the following range:
   n n n n
   Which Module?
   Response: Enter the number(s) of the module(s) to enable.

   The module(s) automatically resets and returns to normal operation.

Appendix- Public Telecommunications Network Connection

This appendix describes supplemental product information that you can use to ensure that your Series 6 Model 70 is correctly installed and complies with various requirements and standards. Refer to the regulatory compliance statements at the front of this manual for other requirements.

Model 70 Connections

The following paragraphs describe the requirements for connecting-the Model 70 to the Public Telecommunications Network (PTN).

Shielded Cables

You must supply and use shielded cables when making connections to any of the following ports:

- Console ports
- Serial ports
- Text-to-Speech (TTS) card ports
- MESA-Net ports
- Disk drive ports

Jack Types

Use standard modular telephone jack types when connecting to the telephone network. Use RJ- 11 C or RJ-2 1X for the cards in a two-wire loop start or DID configuration. Use RJ-2EX or RJ-1CX jacks for E & M operation. Use an RJ-11 C jack for the modem port. Refer to the following table for facility interface codes, port identifications, service order codes, RENs, and network jacks, by port type.

Registration Status	MTS/WATS Facility Interface Code	Port Designation	Service Order Code	REN	Network Jacks
2-wire loop start	02LS2	E line card or AT line card, ports 0-31	9.0F	0.2A	RJ-11C or RJ-21X
2-wire loop start	02LS2	Modem	9.0F	0.3A	RJ-11C
E & M	TL11E or TL11M	E line card or AT line card, ports 0-31	9.0F	0.0B	RJ-2EX or RJ-1CX

For fax cards, the REN is O.OB and the network jack is RJ-11C or RJ-21X.

Connectors and Loads

The Model 70 is connected to the telecommunications network via telephone line cords that terminate in CA11A connectors for loop circuits, or CA2EA connectors for E & M circuits.

The Load Number (LN), assigned to each terminal device, denotes the percentage of the total load to be connected to a telephone loop used by the device and prevents overloading. The termination on a loop may consist of any combination of devices, but the total of the Load Numbers of all the devices cannot exceed 100.

The LN for a Model 70 is 100. No other terminal devices can share the same telephone line while the Model 70 is connected.

Responsibilities of the Equipment Owner

The following paragraphs describe the responsibilities of the equipment owner, subject to the rights of the telephone company and government regulations.

Incidence of Harm

If your equipment harms the telephone network, the telephone company can discontinue your service temporarily. If possible, the company will notify you in advance. If this is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Rights of the Telephone Company

The telephone company may make changes in its facilities, equipment, operations, or procedures, which could affect the proper functioning of your equipment. If this occurs, you will be notified in advance so you can maintain uninterrupted telephone service.

Coin Service or Party line Use

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

List of Centigram Procedures

Procedure Number	Chapter Number	Title	CPs Called	Called By
CP 1340	2	Run a System Information Report		CP 6590, Cl? 6483
CP 5303	5	Recover a Lost Console Passcode		
CP 5304	5	View or Edit History File		CP 6483
CP 5313	5	View Hard Disk Operational Parameters		
CP 5314	5	Change Module Status From Hard Disk		CP 6281 CP 6282
Cl? 5402	3	Install Optional Feature With System Online		CP 6483
CP 5412	5	Back Up a Class of Service		
cl? 5413	5	Restore a Class of Service		
CP 5414	5	Set the System Time and Date		
CP 5415	5	Set the Site Name, Banner, and Code		
CP 5701	5	Run Verify With System Offline		CP 6483
CP 5703	5	Do a Floppy Backup		CP 6592 CP 6483
CP 5704	5	Do a System Restore (system.restore)		
CP 6201	2	Test Basic Telephony Functions	CP 6220 CP 6262	CP 6590
CP 6215	2	Install Printer		CP 6590
CP 6216	2	Install Console		CP 6590
Cl? 6220	4	Remove/Install Line Card	Cl? 6224	
CP 6221	4	Remove/Install Hard Disk	Cl? 6224 CP 6592	CP 628 1 CP 6282 CP 6592
CP 6222	4	Remove/Install Floppy Disk Drive	CP 6224	
CP 6224	4	Remove/Install Cabinet Cover		CP 6220 CP 6221 CP 6222 CP 6281 CP 6282 CP 6284 CP 6592
CP 6258	2	Check Installation Quality		CP 6590

Procedure Number	Chapter Number	Title	CPs Called	Called By
CP 6261	2	Connect the Telephone Lines		Cl? 6201 Cl? 6590
CP 6262	3	Perform an Offline Prompts Update		CP 6201
CP 6263	3	Perform an Offline Software Update	CP 6268	CP 6483
CP 6267	5	Do a System Reload (system.reload)		
CP 6268	5	Shut Down a System		CP 5303 CP 5704 CP 6263 CP 628 1 CP 6282 CP 6483
CP 6270	2	Install Modem		CP 6590
CP 6281	5	Redundant Disk Addition (make.redundant)	CP 6221 CP 6224 CP 6268 CP 6282 CP 7015	CP 6282
CP 6282	5	Disk Addition (add.disk)	CP 6221 CP 6224 CP 6268 CP 628 1 CP 7015 CP 702 1	
CP 6283	5	Online Disk Replacement (Redundant Systems)	CP 6221 CP 6224 CP 6268 CP 7015	
CP 6284	2	Install Redundant Hard Disk	CP 6224	
CP 6483	3	Offline System Software Update	CP 1340, CP 5304, CP 5402, CP 5701, CP 5703, CP 6263, CP 6268, CP 700 1	

Procedure Number	Chapter Number	Title	CPs Called	Called By
CP 6590	2	Model 70 Installation	CP 1340 CP 6201 CP 6215 CP 6216 CP 6261 CP 6268 CP 7001	
CP 6592	5	Offline Disk Replacement (Non-Redundant Systems/Redundant Systems)	CP 5703 CP 6221 CP 6224 CP 6298 CP 7001	
CP 7001	2	Run Verify With System Online		CP 6590 CP 6592 CP 6483
CP 7004	5	Name the Configurations		
CP 7005	5	View the Configuration Names		
CP 7014	5	Enable a Module		
CP 7015	5	Update Disk Redundancy		CP 6281 CP 6282 CP 6283 CP 7019
cl? 7017	5	Shut Down a Hard Disk		
CP 7019	5	Enable a Hard Disk	CP 7015	CP 6281
CP 7021	3	Perform an Online Increase System Hours		CP 6282
CP 7022	5	Add or Cancel a Phoneline Exception		
CP 7025	5	Activate New Software		CP 7000
CP 7029	5	Diagnose a Disk With System Online		
CP 7030	5	Run Diagnose From Hard Disk		
CP 703 1	5	Run Diagnose From Diskette		

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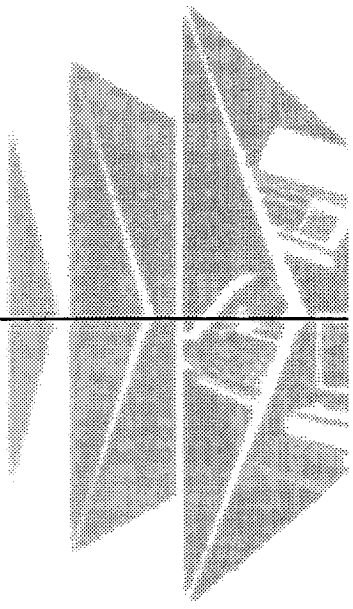
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Voice Processing Solutions

Prompt Installation Instructions



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1. Introduction

This document describes how to install and update prompts diskettes on a Centigram Series 6 server. This information is currently not available in Series 6 documentation.

1.1. Scope

This document covers installation and updating instructions only. It is for use with all prompt sets for software release 6.0, except hotel, for all languages.

1.2. Intended Audience

This document is intended for anyone who needs to install or update prompts on a Series 6 server. This includes customers, field engineers, customer support engineers, and customer education personnel.

1.3. Related Documents

For reference information on how prompts work with VoiceMemo software, refer to the *VoiceMemo Reference and Configuration Manual.* For information about specifying drive types, such as prompts drives, refer to the appropriate *Series 6 Installation and Service Manual* for your server. For information on ordering prompts, *see Product Note 48A, Series 6 System Prompts.*

1.3.1. Obsolete Documents

Procedures CP 6262, CP 7008, and CP 7009, which were included in 5.0x manuals and in drafts of 6.0 manuals, are superseded by this document.

2. New functionality

There are changes in prompt installation between 5.0x software and 6.0 software.

2.1. No Online Installation

For software release 6.0, online prompts installation is no longer an option. In previous releases, prompts could be installed while the server was processing calls

3. Installing New Prompts

This section covers installing new prompts on a Series 6 server. Refer to Section 4 for updating prompts.

3.1. Summary of Installation

To install language prompts, you must do two things: load the prompts onto the server, and enable the prompts. *Loading* the prompts is the process of copying the prompts data to a prompts drive. The user does not have to specify which drive to load the data as the server handles this automatically. *Enabling the* prompts is the process of verifying the serialized diskette (prompts setup diskette) that permits the new prompts to run on the server. This is done by running the add.extracost program.

3.2. Installation Instructions

FOR THE MODEL 120 AND MODEL 70 ONLY: Some server prompts in this procedure may contain generic references to other multiple-module Centigram Series 6 products. The Model 120 and Model 70 are "one module" servers. When asked for the number of the module, always enter "1" or "a" (all.).



WARNING!

This procedure requires that you shut down the system resulting in an interruption to call processing. Centigram recommends that you perform this procedure during periods of low call traffic.

Step 1. Reach the System Maintenance Menu, and execute a system shutdown (menu choice S, System, Shutdown). You are prompted:

```
WARNING!! This will terminate call processing. Type
"shutdown" if you really want to do this
```

Enter shutdown.

Step 2 Specify the modules to shut down. When you are prompted modules to shutdown, enter a for all modules.

Step 3 You arepromptedwait for message waiting queues to be empty? [Y]: Press Enter to wait for the message waiting queues to clear.

Step 4 You arepromptedwait for paging queues to be empty? [Y] : Press Enter to wait for the paging queues to clear.

Step 5 Wait until all lines are off-hook. When prompted Perform Off line System Verification?, respond N to skip the Verify.

Step 6 Reach the Module Maintenance Menu, as follows, and disable all modules. Disable the module connected to the server console last. The prompts are:

```
Enable or disable modules?
```

Enter **Y**. This takes you to the Module Maintenance Menu.

Select (D) Disable a module:

```
Which module?
```

Enter the number of the module to disable. Repeat this choice until finally specifying the module connecting to the server console. When you do so, you are prompted:

```
Warning: Disabling module 1 will result in system reboot!
Do not confirm disable if you do not want this to happen.
Type "disable" to confirm your request.
```

Enter disable to disable the module.

Step 7 The server resets. Wait for the maintenance mode prompt.

Step 8 Run the prompts.add program. When you see the prompt `Enter one of the names: then` respond **prompts.add**.

Step 9 Load the first prompts diskette into the server. (Do *not* load the prompts setup diskette!) When prompted:

```
Insert the 1st diskette containing the prompts and press
return
```

Press Enter. When prompted:

```
Wait until drive light is out, insert language disk  #1,
hit CR when ready.
```

Press Enter. (Do not change disks.) When prompted for each additional diskette, remove the previous one and insert the next one in sequence. Press Enter when the correct diskette is inserted.

Step 10 When the last diskette has been loaded, the server displays the number of directory entries, pointer sectors, and speech blocks used by the prompt partition. You are then returned to the Off-Line Maintenance Menu.

Step 11 The only prompts that do not need to be enabled are the full and hotel sets of American English prompts, mnemonic version (non-numeric). All other prompts must be enabled as described in the next two steps. (However, you can also enable prompts online as described in section 5.2, Online Enable.)

Skip to step 13 if installing American English mnemonic full set, otherwise, continue.

Enable the prompts. When prompted Enter one of the names : enter add.extracost. The prompts are:

```
Enter 'Y' to addextra cost features, 'N' to stop: [N]
```

Enter Y to enable the prompts. When prompted:

```
Insert Extra Cost SETUP disk in the floppy drive
Enter <carriage-return> when ready :
```

Insert the Prompts setup disk and press Enter.

Step 12 Exit the extra-cost menu. When prompted:

```
Do you want to install another extra cost feature? [Y/N] :
[N]
```

Press Enter. You see a number of warning messages. You can ignore the ones about activating the configuration and rebooting the system.

Step 13 When prompted Enter one of the names : enter **host.status.** Enable all modules, enabling the module connected to the server console last.

Select (E) Enable a module:

```
Which module?
```

Enter the number of the module to enable. Repeat this choice until finally specifying the module connected to the server console. When you do so, you are prompted:

```
Rebooting module X.
```

Step 14 The server resets and resumes normal operation.

There are two ways to use the prompts once installed and enabled. You can specify the prompts language as the default language for a line group. Or, create or modify an LCOS for the new prompt language, then specify the LCOS for each mailbox using the language. Complete information on how to perform these tasks *are* in the *VoiceMemo Reference and Configuration Manual,* in the Mailboxes and the Other Classes of Service chapters.

4. Updating Prompts

This section covers updating prompts on a Series 6 server. Refer to Section 3 for information on installing new prompts.

4.1. Summary of Update

To update prompts, you must load the new prompt diskette set onto the server. The update procedure differs from the installation procedure in that prompts do not need to be enabled.

4.2. Update Instructions

To update prompts, follow steps 1 through 10 in section 3.2, Installation Instructions. Then skip to step 13, and follow the rest of the procedure from that point.

5. Related Issues

This section covers related issues with prompts installation and update.

5.1. Numeric Prompts Sets

There are two kinds of numeric prompts sets for American English: full set and overlay. The numeric full set, when installed, does not replace an existing full mnemonic set. The numeric overlay set does replace the mnemonic full set, and cannot be used unless the mnemonic full set was already installed. Numeric overlay sets consist of two diskettes instead of six.

5.1.1, Overlay Set

Overlay sets do not need to be enabled.

It is a known problem that if the overlay set is installed, the configuration report shows "Numeric prompts enabled, prompts not loaded."

5.2. Online Enable

The enabling portion of prompts (Steps 11 and 12) can be performed with the server online. The procedure is identical to loading an optional feature. From the System Maintenance Menu, choose the Additional Options Menu, and then select (A) Add Optional Feature(s). When prompted

Enter 'Y' to add an Optional Feature, 'N' to stop:

respond with Y. When prompted, insert the Prompts Setup diskette, and press Enter. When asked whether to install another Optional Feature, enter N.

If you enable the prompt set online, you must duplicate the active configuration and then activate the inactive configuration. Both these actions are available under the Offline Menu, under System maintenance/Reconfiguration/Reconfigure System.

5.3. Languages per Server

The maximum number of languages available on each type of Series 6 server is listed below.

Server Type	Max. Number of Languages
70	4
1201	4
120s	8
640	12

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MITEL MAIL™

Voice Processing Solutions

Enhanced In-band Integration Manual

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1 Enhanced In-band Integration

The Enhanced In-band Integration (EIB) optional feature allows an AIP VoiceMemo system to accept complex call information as DTMF or MF digits during call setup. In-band signaling refers to sending tones in the voice frequency baud over the same circuit on which the conversation later takes place.

The EIB optional feature comes ready to integrate with the following switches: AT&T System 25, AT&T Legend, Omni, Fujitsu Starlog, Northern Telecom Norstar, Northern Telecom MTX, and IUSACELL Cellular switches. The installer can also program the VoiceMemo system to integrate with other switches that use in-band signaling.

This manual describes the structure of Enhanced In-band Integration and provides procedures for configuring a VoiceMemo system and several switches. Information on specific switches is contained in the appendixes.

Overview

While standard VoiceMemo software can recognize a mailbox number dialed to it, the EIB software can recognize several additional pieces of information provided by the switch. By using pattern matching, the EIB software can recognize the call type (no answer forward, busy forward, direct call) and the origination and destination extension numbers. Based on this information, the VoiceMemo system can play an appropriate mailbox greeting. The VoiceMemo system can also set message waiting indicators (usually a light on the telephone or a broken dial tone) using either the DTMF-to-PBX or RS-232 Message Waiting feature. Figure 1-l shows the information exchanged between the two systems.

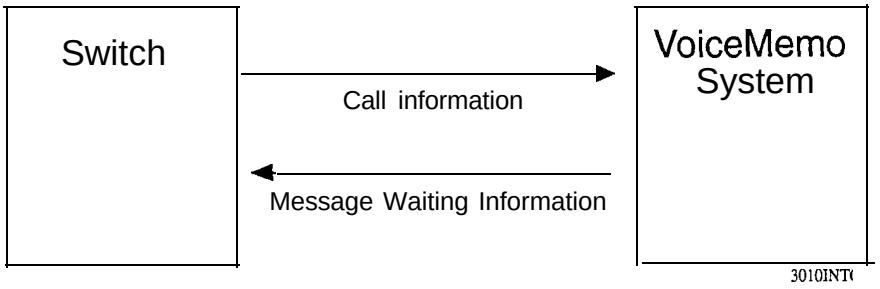


Figure l-l Integration Communications

Enhanced In-band Integration supports the following user features:

- Mailbox owners can forward their calls to the VoiceMemo system so that callers hear mailbox owners' personal greetings.
- Mailbox owners can use conditional greetings to let callers know why they have reached the VoiceMemo system (on the phone, away from desk, and so on).
- Mailbox owners do not need to enter their own mailbox numbers when they call from their own extensions. They only need to enter their passcodes to access the system.
- Callers can choose to transfer to the operator or to some other defined answering point, or they may dial another PBX extension.
- The optional Receptionist II feature can answer outside calls that reach the VoiceMemo system directly.

Note: Some of these features are not supported by all switches. See the appendixes for information about specific switches.

VoiceMemo Release 5.04 allows Enhanced In-band integrations to run on more than one line group. This can be used for:

- Different in-band switches connected to a single VoiceMemo system.
- A single switch with different protocols connected to a single VoiceMemo system. For example, an Omni switch with two tenant groups where one has a three-digit dial plan and the other has a four-digit dial plan.
- A single switch with only one protocol but different VoiceMemo applications. For example, calls to different 800 numbers could reach different line groups and hear different greetings.

How the Integration Works

The Enhanced In-band Integration software uses pattern matching to recognize the call information sent from the switch. It compares the DTMF or MF tones with templates of patterns that define the various call types. Each template defines the following:

- The data expected from the switch
- The action to be performed after receiving the data
- The maximum time between digits
- The action to be performed if an error is encountered

The templates provide the flexibility needed to integrate with different kinds of PBX and CO switches. Generally, each switch integration contains one template for each call type and one to answer the incoming call. If a specific switch has three call types (Ring No Answer, Busy, Direct Call), the integration has a total of four templates.

When the switch routes a call to the VoiceMemo system, it constructs an information packet made of DTMF or MF tones to describe the call. The switch makes a telephone connection to the VoiceMemo system and plays the tones into the VoiceMemo line card. The EIB software decodes the information packet and compares it to the templates, and then plays the appropriate greeting to the caller.

For example, if a caller at extension 123 calls extension 456 and the extension is not answered, the PBX creates an information packet and sends it to the VoiceMemo system, as shown in Figure I-2.

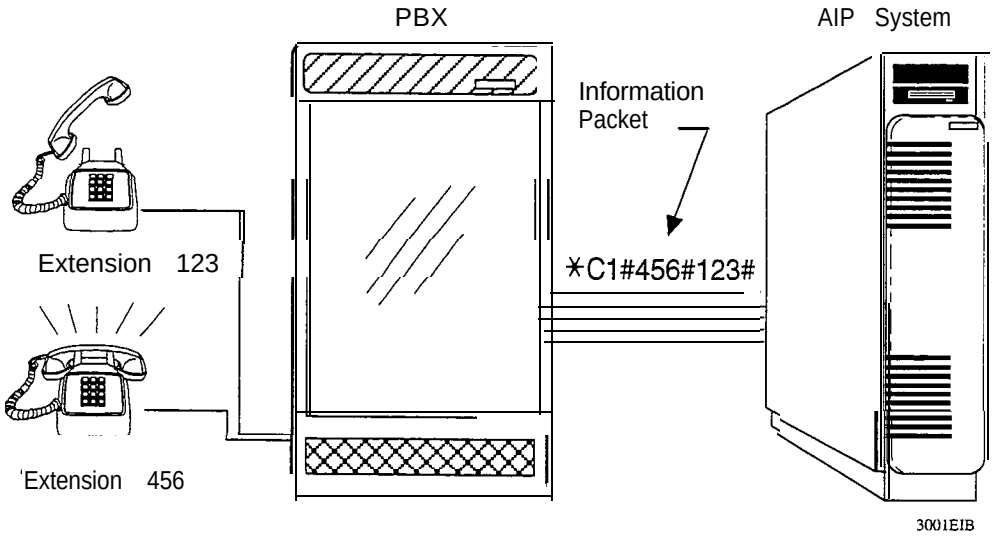


Figure 1-2 Sample Call Handling

This switch uses the DTMF tones *Cl to indicate that the call was not answered. The resulting information packet is shown in Figure l-3.

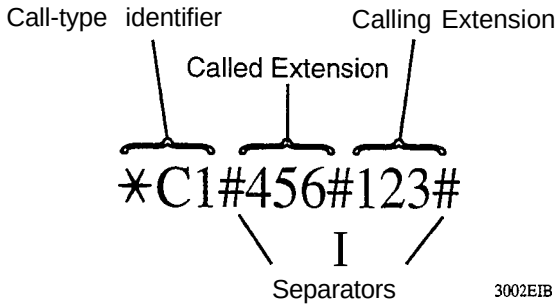


Figure l-3 Sample Information Packet

The EIB software compares the information packet to the expected patterns set in the templates and identifies the call type and the associated mailboxes. The VoiceMemo system then plays the "no answer" greeting for mailbox 456 and records a message. When the mailbox owner calls in, the VoiceMemo system says that the message is from mailbox 123.

The EIB software comes with preprogrammed template sets for many telephone systems, so the installer does not need to create the templates. Using the administrative interface, it is easy to modify existing templates in the field, or create new template sets for additional switches, if necessary.

Template Structure

An Enhanced In-band Integration usually consists of several templates. Each template consists of six fields: Data, Action, Error Action, Time-out, Next Templates, and Comment. All of the fields are explained below, followed by a sample template set.

Data

This field specifies the data expected from the switch. Table l-l lists the valid data items.

Table 1 - 1 Valid Data Field Entries

Data	Description
o-9, *,#	DTMF/MF digits
A-D	DTMF A through D (column four digits)
<, >	MF digits KP and ST, respectively
R	Ring or seizure
T	Dial Tone
H	Hang up
sn	Fixed-length source extension containing n digits (11 max.)
dn	Fixed-length destination extension containing n digits (11 max.)
sxn	Variable-length source extension (11 max.) terminated by DTMF/MF character n
dxn	Variable-length destination extension (11 max.) terminated by DTMF/MF character n
xn	Ignore n digits
Xxn	Ignore all digits until the DTMF/MF digit n

Action

This field tells the VoiceMemo system what action(s) to take if the data received completely matches the template specification. You can specify more than one action. Table 1-2 lists the valid actions.

Table 1-2 Valid Action Field Entries

Action	Description
Dnn	Dial DTMF digits nn (O-V, A-D)
H	Hang-up
T	Go off-hook
Wn	Wink n/10s of a second
wn	Wait n/10s of a second
v0	Play login prompt with passcode required
V1	Play login prompt, passcode optional *
v2	Play Forward All greeting
v3	Play Ring No Answer greeting
v4	Play Busy Forward greeting
V5	Play General greeting (Receptionist II or Message Center greeting)

* The system will not require callers to enter a passcode if FCOS bit 218 is enabled.

Error Action

This field tells the VoiceMemo system what action to perform if it receives unexpected data or if a time out occurs. Valid entries for the error action are the same as for the Action field.

Time-out

This field defines the maximum time, in tenths of a second, to wait for the next digit before performing the error action.

Next Templates

This is a list of the application templates to compare with the next set of incoming digits. The VoiceMemo system simultaneously compares all of the templates listed in this field against each digit and executes the first template to completely match. If the VoiceMemo system executes an error action it terminates the call and does not use the remaining templates.

Comment

This field is optional and can contain a one-line comment for reference. You can put a short description of the template here.

Example Templates

The first two templates for the AT&T System 25 integration tell the AIP VoiceMemo system how to recognize and handle a direct internal call. The programming for template 1 is:

Field	Value	Meaning
Data:	R	Wait for ring
Action:	T	Go off hook
Time-out:	none	Wait indefinitely for ring
Error Action:	none	
Next Templates:	2 3 4 5 6	After ring, compare data with templates 2, 3, 4, 5, and 6 simultaneously
Comment:	Wait for ring and then go off-hook	

The system displays the programming as shown in Figure 1-4. The system always shows the first four fields separated by a comma, even if some of the fields are blank.

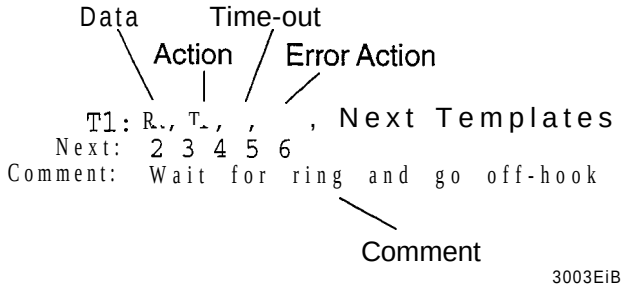


Figure 1-4 Template Programming Display

The second template contains the pattern of DTMF/MF tones that indicate a direct internal call. Note that the EIB software compares incoming data with this template and with templates 3, 4, 5, and 6 simultaneously to find the first match.

The programming for template 2 is:

Field	Value	Meaning
Data:	#00#sx##	Expect #00#, followed by a variable-length source extension number, followed by ##
Action:	V1	Play a login prompt for the source mailbox
Time-out:	10	Wait a maximum of 1 second between digits
Error Action:	H	Hang up if an error occurs
Next Templates:	none	No "next templates;' required because the action field plays a prompt
Comment:	Direct internal call; play login prompt	

The system displays the programming like this:

```
T2: #00#sx##, V1, 10, H
Next:
Comment: Direct internal call; play login prompt
```

Template Execution

The Enhanced In-band Integration application goes through the templates matching incoming DTMF/MF data and performing actions. The process always begins with the first template listed in the application (Template 1) .

The VoiceMemo system waits to receive data from the switch, and then compares that data with the first template's Data field to determine if a match exists. If a match exists, it compares the next data item to the next entry in the field. This process continues until the VoiceMemo system receives either all the data required by the template, unexpected data, or a lapse in data (a time out). When the data completely matches the Data field of a template, the system carries out the action defined in the Action field.

If the template does not play a prompt as its action, the VoiceMemo system compares the remaining incoming data with the template(s) listed in the Next Templates field. The system compares all templates listed in the Next Templates field in parallel. It drops templates from the matching process as it receives non-matching data, and it performs the action in the first completely matching template.

If none of the templates match, the VoiceMemo system performs the error action of the last surviving template.

If the VoiceMemo system receives unexpected data or a lapse in data (time out), it carries out the action specified in the Error Action field. Template execution is complete when the system performs an error action or plays a prompt, or all templates have been executed.

Figure 1-5 uses the AT&T System 25 integration to show how the EIB software matches the incoming data with the templates.

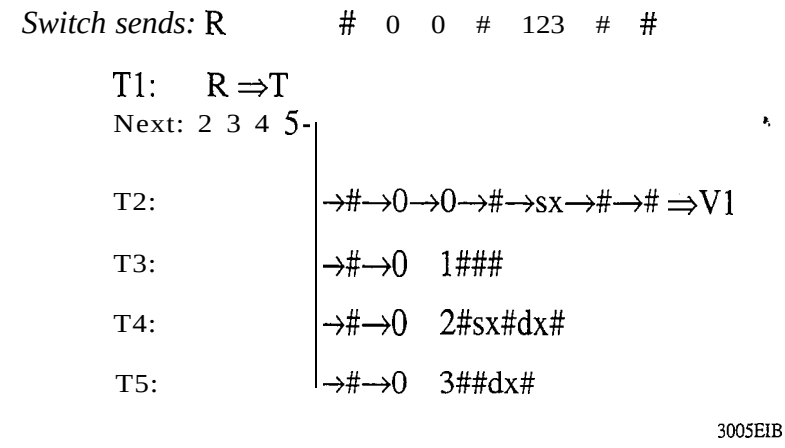


Figure 1-5 Template Pattern Matching

The ring from the switch matches the Data Field in Template 1 completely, and the VoiceMemo system takes the line off-hook. The switch then sends the data packet shown by the digits in the figure. The EIB software compares those digits with templates 2, 3, 4, and 5 in parallel. Templates 3, 4, and 5 drop from the matching process when the first non-matching digit (0) is received. Template 2 matches all the way to the end, and the VoiceMemo system performs the action for that template: V1, play the mailbox login prompt.

Figure 1-6 is a flowchart that shows the process of template execution.

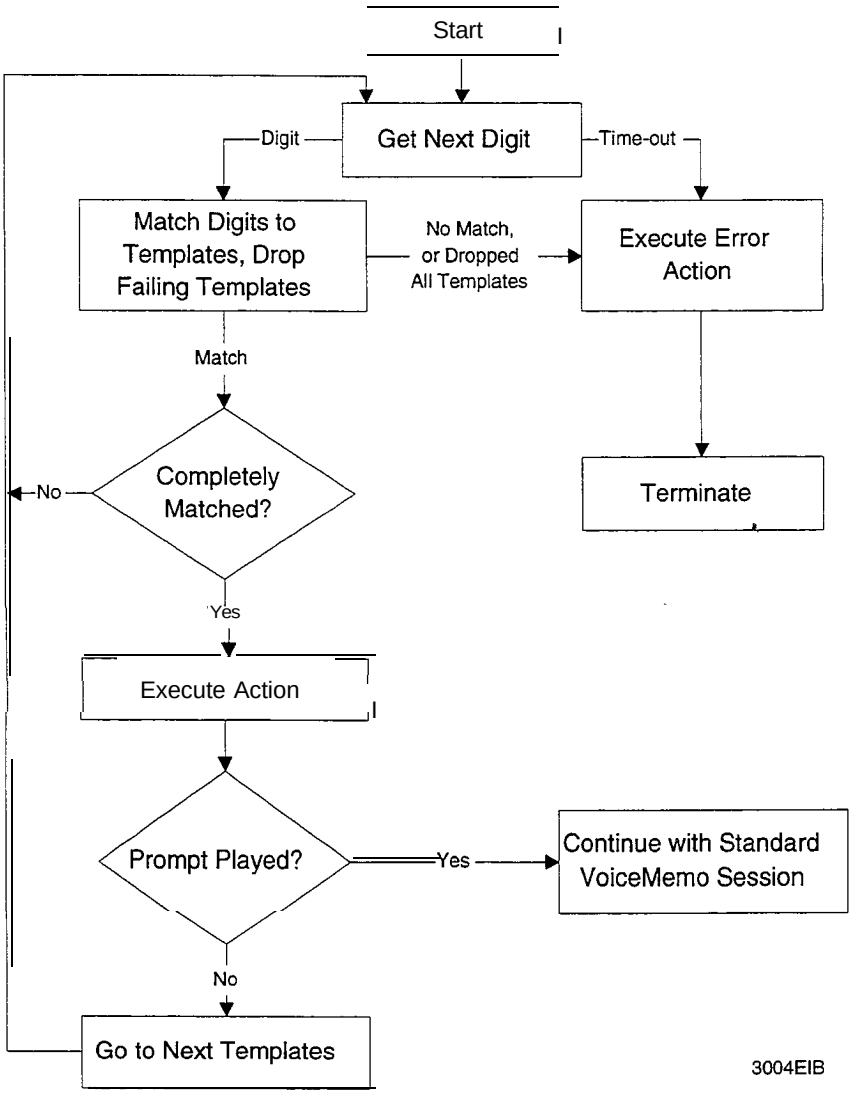


Figure 1-6 Template Execution

Note: Templates only describe the protocol during call setup. Template execution is complete once the VoiceMemo system starts to play a greeting or perform an error action, and the response to any additional digits is determined by standard VoiceMemo software.

Template Rules

The following rules apply when creating or modifying a template:

1. Both Data and Action fields must not be blank. Only one of the two fields can be blank. Templates always have comma separators, even if fields are blank.

2. If more than one template in a group of Next Templates matches the received data, the system carries out the action of the first matching template (in order of template number). Therefore, you should specify templates in the order of priority for their actions.

3. If all the templates in a group of next templates fail, the system performs the error action of the last surviving template.

4. If a time out occurs while receiving digits, the system performs the error action for the template with the longest time out value. If all the templates in the group have the same value, the system performs the first template's error action.

5. If the system recognizes invalid entries in the Data field at any time during template execution, it drops the template and writes an entry in the error log. It does not perform an action or error action for that template.

6. If the Time-out field is left blank, the system uses a value of 0 for the inter-digit time out. The time out value does not apply while waiting for a ringing event in template 1.

7. The maximum length for the Time-out field is 4 characters. The maximum length of all other fields is 80 characters.

8. All actions that begin with Vn, where n is a prompt number, must be the last action in the template.

9. Except for rule #1, you can leave any fields blank.

10. All template fields are case sensitive.

11. You cannot leave any spaces between the variable length string (source or destination number) and the termination digit.

12. Except for rule #11, you can use spaces to enhance the readability of the template. Spaces are sometimes required. For example, an eleven-digit source extension followed by the digits 12 must be entered as "s11 12" to distinguish it from "s1 112."

13. When a different application (template set) is activated, the changes take affect on the next call placed to the system; no reboot is necessary.

Deriving Mailbox Numbers

The source and destination digits sent from the switch do not always match exactly with VoiceMemo mailbox numbers. You can use two features with the Enhanced In-band option to translate the incoming digits to an arbitrary VoiceMemo mailbox number.

Digit Absorption

Digit absorption shortens the incoming extension numbers to a fixed number of digits. For example, if your switching system sends seven-digit extension numbers and you want to use four-digit mailbox numbers, you can set the Calling and Called Extension Absorbed Digits fields to 3 to absorb the leading three digits.

Digit Offset

Digit offset transforms the incoming strings into a different mailbox number by adding or subtracting a given number. If the switching system sends a 1234 and the Called Extension Signed Offset is +200, the VoiceMemo system changes the extension number to mailbox 1434.

Conditional Greetings

Mailbox owners can use conditional greetings to let callers know why they reached the VoiceMemo system-no answer, busy, or call forward. If the dialed extension was busy, the caller hears the Busy greeting. If the called party did not answer, the caller hears the Ring No Answer greeting. Mailbox owners can use the prerecorded conditional greetings or they can record their own greetings.

The conditional greetings are enabled in a user's FCOS, however users must activate the feature from within their own mailboxes.

Note: Not all switches can provide the call information required to support conditional greetings.

Administrative Interface

You use both offline and online menus to configure an Enhanced In-band Integration on a VoiceMemo system. You use the offline menus to define a new line group, assign the line group to the Enhanced In-band Integration, and configure application parameters. You use the online menus to install the integration template set or configure an existing template set.

The final step required to fully configure an Enhanced In-band Integration is to set the mailbox message waiting types.

The Enhanced In-band Integration option works with incoming calls; it does not provide a means to activate message waiting indicators. Either the DTMF-to-PBX or the RS-232 Message Waiting application can perform this function. Both message waiting methods are included with the base software; see the *VoiceMemo Reference and Configuration Manual* for details.

Loading a Template Set

All application template sets are copied onto the hard disk when you load the Enhanced In-band Integration optional feature diskette. You then must select and install a specific application template set to activate the integration.

Modifying a Template

You can modify an existing EIB integration application by editing the templates. You can save a modified application with its original name or a new name. Using the original name to save the file overwrites the original template.

You cannot overwrite applications that are provided by Centigram; you must save any changes under a different application name. If you do not save your changes, and then later make additional changes or install a different template set, you cannot go back to the unsaved version.

Creating a Template

If there is no template set for your switch, you can create a set using the administrative menus. You create an integration template (or set of templates) by editing templates in the online menu-the same procedure as modifying a template. There is a worksheet at the end of this manual to help you design templates for your switch.

Feature Interactions and limitations

- VoiceMemo Releases 5.02 and 5.03 allow only one Enhanced In-band Integration line group per system. Unpredictable system behavior is likely if you use more than one integration. Release 5.04 supports multiple line groups of EIB integration.

- Not all switches support all of the features and call types available with Enhanced In-band Integration. Refer to your switch documentation for more information on the features available with your particular switch.

2 Menu Parameters

This chapter lists menu choices available in a VoiceMemo system. You can use this information when planning and installation or when filling in the VoiceMemo worksheets. At an AIP maintenance console, most menu choices require input from you, such as numbering a line group or answering yes to a yes/no question. These choices change the configuration of the system, depending on what you enter. Many other menu choices change the system's status, such as starting a program or printing a report. Still other menu choices are navigational only – they go to a submenu or return you to a starting point. Navigational choices are excluded from this chapter, since they have no effect on the system.

How to Use This Chapter

Refer to this chapter when you need more information about a menu item and what kind of input is needed, what ranges are acceptable, and what units are used for any numerical entries.

The following sections are included, when appropriate, for each menu item:

Location in Menus The name of the menu the selection appears in. For example, the Reports menu choice is on the main menu, so that entry would read Main Menu.

What to Enter What the system expects you to type. All options are included here. In most cases, you can enter a question mark (?) for on-line help.

Default What the system assigns to this choice if you do not alter it, or if you reset the system back to its defaults.

How It Works An explanation of what happens when you select this choice.

Other Requirements What you must do in other menus or have in terms of hardware or software to implement this choice.

Tips & Techniques Suggestions and examples for using this menu choice,

Interactions & Limitations How this parameter could affect others in another part of the VoiceMemo application.

See Also Other menu parameters or reference material that you may find useful.

Action

Location in Menus In-band Edit Template Menu

What to Enter The action to be performed when the received data matches. Table 2-l contains a list of all valid entries for the Action field.

Table 2-1 Valid Action Field Entries

Action	Description
D*n*	Dial DTMF digits *n*, (O-9, A-D) max 23
H	Hang-up
T	Go off-hook
Wn	Wink n/10s of a second
wn	Wait n/10s of a second
v0	Play login prompt with passcode required
V1	Play login prompt, passcode optional *
v2	Play Forward All greeting
v3	Play Ring No Answer greeting
v4	Play Busy Forward greeting
V5	Play General greeting (Auto Receptionist or Message Center greeting)

* The systemwill not require callers to enter a passcode if FCOS bit 218 is enabled.

How It Works VoiceMemo matches the templates to the incoming data. After a match has been reached, the template performs the action.

Tips & Techniques The Action Field entries are case sensitive "w" is different from "W."

Interactions & Limitations Line cards will wink automatically when line exception 24 is enabled. Turn it off to control winks from the in-band templates. Note that you can control the time before a wink (wn), the duration of a wink (Wn), and the wait after a wink (wn).

See Also Error Action

Application Description

Location in Menus Enhanced In-band Menu

What to Enter A one-line description of the application.

Default On integrations provided by Centigram, this value is filled in automatically. If you are creating a new set of application templates, use this entry to describe the new application.

How It Works The application description provides more information than the application name allows.

Interactions & Limitations This field entry is limited to one line.

Tip & Techniques This field is for the user's record keeping.

Application Name

Location in Menus Enhanced In-band Menu

What to Enter A short descriptive name for the application.

Default The default value is determined by the optional feature integration that is installed. For example, with the AT&T System 25 integration installed, this value defaults to SYS25.

How It Works Enter the name of the application template set to use or the name of the new application template set.

Interactions & Limitations There must not be any spaces in the application name. The application name must not contain any reserved words from the template language. The application name must be less than or equal to 10 characters.

Tips & Techniques This is the name of the file that stores the application templates on the disk, for example, SYS25.

Backup Application

Location in Menus Enhanced In-band Menu (Release 5.03 only)

What to Enter No entry required.

How It' Works When you select to backup an application, the system will save a copy of the current template set on the hard disk. You can later reload this application to put it into service or make more changes.

Tips & Techniques Use an application name that is easy to remember.

Interactions & Limitations If there is already an application with the same name on the hard disk, the system will ask you if you want to overwrite the existing application. You cannot overwrite any of the applications provided by Centigram.

See Also Save Application

Called Extension Absorbed Digits

Location in Menus In-band Integration Menu

What to Enter The number of leading input digits to absorb from the called extension. The acceptable range is from 0 to 12 digits.

Default 0 digits

How It Works Some switches and PBXs send digits (O-9, *, #) before the extension; this feature allows those digits to be removed. After the digits have been absorbed, the remaining digits are passed to the application templates.

Interactions & Limitations Do not set this parameter to absorb the digits that identify different call types.

See Also Calling Extension Absorbed Digits

Called Extension Signed Offset

Location in Menus In-band Integration Menu

What to Enter The numerical constant to be added to the called extension received.

Default 0 digits

How It Works This adds or subtracts offset to the called extension. Offsets are added to or subtracted from the extension digits on a digit-by-digit basis. This allows for VoiceMemo mailbox numbers that are different from the switching system dialing plan.

Interactions & Limitations This adds or subtracts without producing any addition carry or subtraction borrow. It is normally used to make a three-digit extension into a four-digit mailbox number, or vice-versa. For example, if an extension is 234 and the signed offset is +1000, the result is 1234.

Calling Extension Absorbed Digits

Location in Menus In-band Integration Menu

What to Enter The number of leading input digits to absorb from the calling extension. The acceptable range is from 0 to 12 digits.

Default 0 digits

How It Works This absorbs a programmable number of digits from the beginning of the calling extension number. Some switches and PBXs send digits (O-9, *, #) before the extension; this feature allows those digits to be removed. After the digits have been absorbed, the remaining digits are passed to the application templates.

Interactions & Limitations Do not set this parameter to absorb the digits that identify different call types.

See Also Called Extension Absorbed Digits

Calling Extension Signed Off set

Location in Menus In-band Integration Menu

What to Enter The numerical constant to be added to the extension received.

Default 0 digits

How It Works This feature adds or subtracts a specified offset to the incoming extension number. Offsets are added to or subtracted from the extension digits on a digit-by-digit basis. This allows for VoiceMemo mailbox numbers that are different from the switch dialing plan.

Interactions & Limitations This adds or subtracts without producing any addition carry or subtraction borrow. It is normally used to make a three-digit extension into a four-digit mailbox number, or vice-versa. For example, if an extension is 234 and the signed offset is + 1000, the result is 1234.

See Also Called Extension Signed Offset

Comment

Location in Menus In-band Edit Template Menu

What to Enter Comments to help the user's understanding of the application template. Comments can be a maximum of 128 characters long.

Default Blank

Current Template

Location in Menus In-band Edit Template Menu

What to Enter The number of the template that you wish to modify or create.

Default Template 1

How It Works This selects the template to edit in the integration application (for example, template 3 of 21). Each integration application can contain multiple templates.

Other Requirements The template format and definitions for actions and data must be known before this menu is used.

Interactions & Limitations The VoiceMemo system only checks the syntax of the integration template (for example, the existence of comma separators), not the content. It is the user's responsibility to ensure the template integrity. The Enhanced In-band Integration application functions according to the template; if the template is incorrect, the template language has no way to detect that a problem exists.

Data

Location in Menus In-band Edit Template Menu

What to Enter Valid in-band events. These are the DTMF/MF and other events expected from the switch (for example, ring, dial tone, etc.). Table 2-2 contains a list of all valid entries for the Data field.

Table 2-2 Valid Data Field Entries

Data	Description
o-9, *,#	DTMF/MF digits
A-D	DTMF A through D (column four digits)
<, >	MF digits KP and ST, respectively
R	Ring or seizure
T	Dial tone
H	Hang up
s*n*	Fixed-length source extension containing *n* digits (11 max.)
d n	Fixed-length destination extension containing *n* digits (11 max.)
sxn	Variable-length source extension(11 max.) terminated by DTMF/MF character *n*
dxn	Variable-length destination extension (11 max.) terminated by DTMF/MF character *n*
X*n*	Ignore *n* digits
Xx*n*	Ignore all digits until the DTMF/MF digit *n*

Default This field defaults to empty (no events expected).

How It Works When an incoming DTMF/MF signal is detected, it is converted to its numerical form and compared to the data listed in this field.

Error Action

Location in Menus In-band Edit Template Menu

What to Enter The action code to take if a time out or incorrect data is received. Table 2-3 contains a list of all valid entries for the Error Action field.

Table 2-3 Valid Error Action Field Entries

Error Action	Description
D*n*	Dial DTMF digits *n*, (O-9, A-D) max 23
H	Hang-up
T	Go off-hook
W n	Wink n/10s of a second
wn	Wait n/10s of a second
v o	Play login prompt with passcode required
V1	Play login prompt, passcode optional *
v 2	Play Forward All greeting
v 3	Play Ring No Answer greeting
v 4	Play Busy Forward greeting
V5	Play General greeting (Auto Receptionist or Message Center greeting)

* The systemw not require callers to enter a passcode if FCOS bit 18 is enabled.

Tips & Techniques The Error Action Field entries are case sensitive – "w" is different from "W."

Interactions and Limitations If several templates experience a time out or receive unexpected data, the template that is the last to match performs its error action.

Line cards wink automatically when line exception 24 is enabled. Turn it off to control winks from the in-band templates. Note that you can control the time before a wink (wn), the duration of a wink (Wn), and the wait after a wink (wn).

Host Number

Location in Menus In-band Integration Menu

What to Enter Module number (1-4).

Default 1

How It Works This parameter works with the "Number of Inband Tasks on This Host" parameter to set the amount of system CPU resources assigned to an Enhanced In-band Integration. Use this parameter to select a module

(host), and then use the "Number..." parameter to set the number of tasks for the module. Repeat the procedure for each module that has phone ports assigned to an Enhanced In-band line group.

Interactions & Limitations This parameter is only required for VoiceMemo Releases 5.02 and 5.03 software. Release 5.04 configures the number of tasks per module automatically.

See Also Number of Inband Tasks on This Host

Install Application

Location in Menus Enhanced In-band Menu

What to Enter The name of the application that you wish to install. Note that the name is case-sensitive, i.e., "Sys25" is not the same as "SYS25."

Default No default.

How It Works The named application is loaded so that you can make changes or put it into service. You should backup the application if you make any changes. When you want to put an application into service, you must exit from the Enhanced In-band Menu to the Online Menu, and then choose to exit and save changes. The new application starts service on the next call into each phone port.

Tips & Techniques If you are not sure of the application name or its spelling, use the List Applications option before attempting to install an application.

See Also Application Name, List Application

list Applications

Location in Menus Enhanced In-band Menu

What to Enter No entry required.

How It Works This menu choice displays a list of all enhanced in-band applications on the system.

Tips & Techniques Select this option before choosing Install Application if you are not sure of an application name or its spelling.

See Also Application Name, Install Application

MF Enable

Location in Menus In-band Integration Menu

What to Enter Yes to enable MF signaling or No to disable.

Default No (MF signaling disabled)

How It Works When enabled, this parameter tells VoiceMemo to expect MF signaling from the switching system. Some switches and PBXs use Multi-frequency (MF) signaling, others use Dual Tone Multi-Frequency (DTMF) signaling. The VoiceMemo system only looks for one type of signaling during call setup, therefore you must set the integration to work with the signaling provided by the switching system.

Interactions & Limitations This parameter only affects signaling during the in-band call setup. Normal user interaction with the AIP system is always via DTMF.

Next Templates

Location in Menus In-band Edit Template Menu

What to Enter The number of the next template or templates, separated by spaces, to compare further data against.

Default Blank

How It Works When incoming data completely matches a template specification and the template action does not play a greeting or hang up, the system looks at the templates listed here to continue comparing against incoming data. If more than one template is listed, the system compares all of them simultaneously.

Number of In-band Tasks on This Host

Location in Menus In-band Integration Menu

What to Enter The number of system tasks to service the in-band ports on a given module. The valid range is l-32.

Default 2

How It Works This parameter works with the Host Number parameter to set the amount of system CPU resources assigned to an Enhanced In-band Integration. First select a module (host), and then use this parameter to set the number of tasks for the module. Repeat the procedure for each module that has phone ports assigned to an Enhanced In-band line group.

Tips & Techniques A good rule of thumb for determining the correct number of in-band tasks for each module is to begin with a value of 20% of the number of ports assigned to the Enhanced In-band line group. If more than two rings occur before a greeting is played, increase the number of tasks. An exception is for integrations that use line exception 24 to provide immediate wink on E&M trunks; in these cases the number of tasks should equal the number of in-band ports.

Interactions & Limitations Each task uses more system memory; to preserve system performance, do not configure more tasks than necessary.

This parameter is only required for VoiceMemo Release 5.02 and 5.03 software. Release 5.04 configures the number of tasks per module automatically.

See Also Host Number

Save Application

Location in Menus Enhanced In-band Menu (Release 5.04 only)

What to Enter No entry required.

How It Works When you select to save an application, the system will save a copy of the current template set on the hard disk. You can later reload this application to put it into service or make more changes.

Tips & Techniques Use an application name that is easy to remember.

Interactions & Limitations If there is already an application with the same name on the hard disk, the system will ask you if you want to overwrite the existing application. You cannot overwrite any of the applications provided by Centigram.

See Also Backup Application

Show Application

Location in Menus Enhanced In-band Menu

What to Enter No entry required.

Other Requirements This option shows all information about the current application, including the application name and description, its installation date and last modification date, and all of its templates.

Tips & Techniques Use this option to see all of an application's templates at once, especially before editing the application.

Show Number of In-band Tasks on Each Host

Location in Menus In-band Integration Menu

How It Works This displays the details for each in-band task on each module. This feamre allows you to check your previous work.

Interactions & Liiitations This option is only available in Release 5.03.

Time-out

Location in Menus In-band Edit Template Menu.

What to Enter The time, in tenths of seconds, between received digits to wait before an error condition occurs.

Default This field defaults to 0 tenths of a second.

How It Works The value of the timeout is set in the template. If there is too much delay between digits coming from the switch, the time out timer expires. When the timeout has expired, the system carries out the error action for the template.

List of Detailed Procedures

Procedure Number	Title	Release Number
DP 3021	Connect the Chassis Ground to the Rack-Mount VoiceMemo System	5.03
DP 5402	Perform an Online Optional Feature Installation	5.04A
DP 6028	Define a Line Group for Applications	5.03
DP 6034	Add or Delete Receptionist II Extensions	5.03
DP 7006	Assign the Enhanced In-band Integration Application to a Line Group	5.03
DP 7007	Configure In-band Digit Absorption and Signed Offset	5.03
DP 7010	Install an Enhanced In-band Integration Template Set	5.03
DP 7011	Modify an Enhanced In-band Integration Application	5.03
DP 7016	Set In-band Module Numbers and Number of Tasks	5.03
DP 7022	Add or Cancel a Phoneline Exception	5.03
DP 7023	Enable Conditional Greetings	5.03
DP 7501	Create a New Enhanced In-band Integration	5.03

list of General Procedures

Procedure Number	Title	Release Number
GP502	Configure an Enhanced In-band Integration	5.03
GP 504	Configure Omni Integration	5.03
GP 505	Configure Fujitsu Starlog Integration	5.03
GP 506	Configure AT&T System 25 Integration	5.03
GP507	Configure Northern Telecom Norstar Integration	5.03
GP 508	Configure AT&T Legend Integration	5.03
GP509	Configure Northern Telecom MTX Integration	5.03

Tusk	*Procedure*

Enhanced In-band Integration

Configure an Enhanced In-baud Integration	**GP 502**
Configure AT&T Legend Integration	**GP 508**
Configure AT&T System 25 Integration	Gl? **506**
Configure Fujitsu Omni Integration	**GP 504**
Configure Fujitsu **Starlog** Integration	**GP 505**
Configure Northern Telecom MTX Integration	**GP 509**
Configure Northern Telecom **Norstar** Integration	**GP 507**
Add or Cancel a Phoneline Exception	DP 7022
Add or Delete Receptionist II Extensions	DP 6034
Assign the Enhanced In-band Integration Application to a Line Group	DP 7006
Configure In-band Digit Absorption and Signed Offset..	DP 7007
Connect the Chassis Ground to the Rack-Mount VoiceMemo System	DP 3021
Create a New Enhanced In-band Integration	DP 7501
Define a Line Group for Applications	DP 6028
Enable Conditional Greetings	DP 7023
Install an Enhanced In-band Integration Template Set	DP 7010
Modify an Enhanced In-band Integration Application	DP 70 11
Perform an Online Optional Feature Installation	DP 5402
Set In-band Module Numbers and Number of Tasks	DP 7016

Configure an Enhanced In-band Integration

VoiceMemo Release 5.03 and later

This procedure describes the steps required to configure your AIP VoiceMemo system with Enhanced In-band Integration. These steps include a Detailed Procedure that is a sample for reference when creating in-band templates for use with your particular switch.

Use this procedure if there is no default template set available for your switch.

Step	*Reference*
1. Install the Enhanced In-band Integration optional feature diskette.	)P 5402
2. Define a line group for the integration.	)P 6028
3. Assign the Enhanced In-Band Integration application to the line group.	)P 7006
4. If your AIP system has Release 5.03 software, set the number of in-band tasks 'per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required-number of tasks.	)P 7016
5. Create a set of Enhanced In-band Integration templates to work with your switch capabilities. The worksheet in the back of this manual can help you plan the templates.	)P 7501
6. Refer to the Task List in your *VoiceMemo Reference and Configuration Manual* to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu. - Schedule Company Greetings - Enable Call Placement Message Delivery - Configure for Transfer to System Attendant - Define an Administrator's Mailbox - Define an Attendant's Mailbox - Configure Passcode Parameters - Enable Dial-by-Name - Set a default language for the line group - Enable multiple messages for outside callers	Menu Map 13
7. Exit and save your changes.	
8. Configure message waiting for the VoiceMemo system, either RS-232 Message Waiting or DTMF-to-PBX Message Waiting. If your switch does not support any type of message waiting indication, you can configure paging or message delivery to let users know when new messages arrive. See your *VoiceMemo Reference and Configuration* Manual for details.	

Configure Omni Integration

VoiceMemo Release 5.03 and later

This procedure summarizes the steps required to install and configure the Enhanced In-band Integration to work with the Omni PBX. Refer to the appendixes for reference information about this integration.

There are two sections to installing this integration: installing and configuring the software on the VoiceMemo system, and configuring the Omni PBX. Refer to your Omni documentation for help when configuring the PBX, if necessary.

Step	*Reference*
Configure the VoiceMemo System	
1. Identify the line cards that will be used to integrate with the Omni PBX. Shut down the VoiceMemo system and strap the line cards for Type 1 E & M signaling. See the *VoiceMemo Installation and Service Manual* for details. If you plan to use DTMF-to-PBX message waiting, identify at least one additional port and strap it for Type 1 E & M signaling.	
2. Restore power to the VoiceMemo system and allow it to initialize.	
3. Install the Enhanced In-band Integration optional feature diskette.	OP *5402*
4. Define a line group for the integration.	OP *6028*
5. Assign the Enhanced In-Band Integration application to the line group.	OP *7006*
6. Select the Omni integration application that matches your dialing plan (three or four digit extensions).	OP 7010
7. Use the Edit Parameters Menu to enter the dummy extension for message retrieval calls (see step 8 of the Omni instructions, below).	
8. Refer to the Task List in your *VoiceMemo Reference and Configuration Manual* to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu. - Schedule Company Greetings - Enable Call Placement Message Delivery - Configure for Transfer to System Attendant - Define an Administrator's Mailbox - Define an Attendant's Mailbox - Configure Passcode Parameters - Enable Dial-by-Name - Set a default language for the line group - Enable multiple messages for outside callers	Menu Map 13

Step	*Reference*
9. If your VoiceMemo system has Release 5.03 software, set the number of in-band tasks per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required number of tasks.	DP 7016
10. Set the following phone line exceptions for each line in the line group: Exception Value Description 08 10 Dead Line Time-out 24 Y Enable Wink Start signaling 32 20 Received DTMF Debounce 35 0 Sleep After Hangup, seconds	DP 7022
Note: If messages are clipped at the beginning, increase the value of line exception 142 to 75 (Inhibit Play Time, defaults to 0.01 seconds)	
11. If desired, add feature bits 161 and 162 to users' FCOSs, and have users activate their conditional greetings.	DP 7023
12. Configure either the DTMF-to-PBX or RS-232 message waiting application. See *the VoiceMemo Reference* and *Configuration Manual* for details.	
13. If your VoiceMemo VoiceMemo system has the Receptionist II application installed, configure it for supervised transfer to allow callers to return to the VoiceMemo system after reaching a busy extension. *See the Receptionist II Manual* for details.	

Configure Omni Hardware

1. Strap the two-wire E & M cards for type 1 E & M signaling.
2. Cross-connect the E & M lines from the Omni PBX to the VoiceMemo system as follows:

   E - E
   M - M
   T - T
   R - R

3. Connect the Omni and VoiceMemo systems to same ground point.	DP 3021
4. Configure the E & M trunks on the Omni PBX to be type 1 E & M.	

Step *Reference*

5. Use the following RC transactions to add the hardware to the system data base. Select double-height slots to accommodate the EMT cards.

RC 221 Add a Card

```
CARD        CARD
TYPE     FB NUMBER
----   ----------
 EMT     FB-17201
```

RC 153 Add a Trunk

	VoiceMemo Trunks	Message Wait Trunk
Physical Trunk Type	E & M	E & M
Supervisory Incoming	Wink	ID
Supervisory Outgoing	Wink	--

Configure Trunks for the Enhanced In-band line Group

6. Use the following RC transactions to add the Enhanced In-band trunk group. (You configure the message wait trunk and the analog lines in later steps.)

RC 161 Add/Change Trunk Group Characteristics 1

```
TRUNK SIGNALLING
                                  ---IN----  ----OUT----        PAD
TRK                  N                RTN          DIAL   ALT -CLASS-
GRP  TRUNK    DSP  DSP  TRK  SGNL  DIAL  SGNL  TONE   TRK 2-  3-  AGENT
NO.  APPL.    COS  COS  DIR  TYPE  TONE  TYPE  RTND   GRP WAY WAY GROUP
---  -------- ---  ---  ---  ----  ----  ------  ----  --- --- --- -----
XXX   TIE     YY   ZZ   TW     TC   --     TC     N     --  03   4    -

DO YOU WANT DTMF SIGNALS BLOCKED? Y/N >N
```

Where XXX is the trunk group number
YY is the displayable COS
ZZ is the non-displayable COS

RC 169 Add/Change Trunk Group Characteristics 2

```
 VMS
TRUNK
-----
  Y
```

Step *Reference*

RC 212 Change/Show Non-Displayable Class of Service 1

```
        R
H       E
O F     CD      AP
O L     EI      DH
K A     ID      MO
s s     V       I N
W H     E       N E
---     ---     ---
 Y       Y       N
```

RC211 Change/Show Displayable Class of Service 1

```
S
T A       A             0
A C     T C             N
T C     OC      M     M
I E     LE      E     EN
0 s     LS      R     RE
N S       s     s     ST
---     ---     ---   ---
 Y       Y      Y      Y
```

7. Use RC 218 to assign a directory number for the Enhanced In-band trunk group. This DN is the destination for all forwarded calls. If your system has the Receptionist II application, it is also the termination point for incoming trunk calls.

```
DIR NUM        TYPE        IDENTIFIER
-------------------------------------
xxx            VMS         yyzz
```

Where XXX is the directory number
yy is number of mailbox digits
zz is the VoiceMemo Enhanced In-band Trunk Group number

Note: You do not need to program a hunt group for calls to reach the VoiceMemo system. The number of the VoiceMemo trunk group in the IDENTIFIER associates this DN with trunks that you marked as VMS trunks in step 6.

Step | Reference

8. Use RC 113 to create a "dummy" extension, and then forward that extension to the DN for the Enhanced In-band trunk group with RC 141. This extension is the number that users must dial to retrieve their messages. You should select an easy-to-remember number for this extension.

```
DIR       --COS--   DIV  DIV    DIV
NUM       D     N   CND  DST    ID
-----------------------------------
XXXX      YY   zz    DA   VM
```

Where XXX is the DN for message retrieval from step 7
YY/ZZ is the Basic Class of Service

Configure Message Waiting Trunk

9. Use the following RC transactions to add the message waiting trunk group. The trunk group probably only contains one trunk.

RC 161 Add/Change Trunk Group Characteristics 1

```
TRUNK SIGNALLING
                                ---IN----- ----OUT----          PAD
TRK                  N                RTN          DIAL  ALT  -CLASS-
GRP  TRUNK  DSP  DSP TRK SGNL DIAL   SGNL TONE  TRK  2-   3-   AGENT
NO.  APPL.  COS  COS DIR TYPE TONE   TYPE RTND  GRP  WAY  WAY  GROUP
--- ------- --- --- --- ---- ----- ------ ----  ---  ---  ---  -----
XXX  TIE    YY  ZZ  IN   TC   DT    --     N     --   03   4    -

DO YOU WANT DTMF SIGNALS BLOCKED? Y/N >N
```

Where XXX is the trunk group number
YY is the displayable COS
ZZ is the non-displayable COS

RC 169 Add/Change Trunk Group Characteristics 2

```
 VMS
TRUNK
-----
  Y
```

Step	*Reference*

RC 212 Change/Show Non-Displayable Class of Service 1

```
        R
H       E
OF      CD      AP      00
OL      EI      DH      RN
KA      ID      MO      IL
ss      v       IN      GY
WH      E       N E
---     ---     ---     ---
 N       N       Y       Y
```

RC 211 Change/Show Displayable Class of Service 1

```
S
T A       A           0
AC        TC          N
TC      OC      M     M
IE      LE      E     EN
OS      LS      R     RE
N S       S     S     ST
---     ---     ---   ---
 N       N       N     N
```

10. Set the following values for the E & M trunk groups. These fields are not accessible through RC transactions.

T5841	Trunk Group outpulsing delay value = 0
T5751	Trunk Group AIOD Channel/Rev BAT Check bit for trunk call queuing allowed = Yes
T5831	Trunk Group momentary open OUTGOING field = 300 ms > (greater than) VoiceMemo hook flash time
T5661	Trunk Group Restriction Table = Trunk Transfer Allow
T5641	Trunk group direction/disconnect = 2-way/both for VoiceMemo trunks, IN/-- for Message Wait ports trunk
T6341	Trunk Group miscellaneous flags bit for Attendant recall on No Answer = (

Step *Reference*

Configure User Stations

11. Allow user stations to forward to the VoiceMemo system and receive message waiting indication with the following RC transactions.

RC 212 Change/Show Non-Displayable Class of Service 1

```
C V      M
A A      A
L R      I
L I      L
F A   V  B
W B   M  O
DL     SX
---   ---
 Y     Y
```

RC 214 Change/Show Non-Displayable Class of Service 2

```
MESSAGE
WAITING
  LAMP
-------
   Y
```

12. Change all user COSs with RC 211 to allow access to the Enhanced In-band trunk group.

13. Use the following RC transactions to assign Message Retrieval to FeaturePhones.

RC 117 Change/Assign Non-Displayable Class of Service (Line Location)

RC 113 Add/Change/Delete/Show/Show Where Line Features 1

RC 211 Change/Show Displayable Class of Service 1

RC 212 Change/Show Non-Displayable Class of Service 1

Make Miscellaneous Changes

14. Set the following values. These fields are not accessible through RC transactions.

T6241 Digit Analysis/First Digit Access Code marked as first digit of a two-digit access code.

T6251 Digit Analysis/Second Digit Access Code identifies the digit string to be dialed by the VoiceMemo system for message wait on and off requests. The values can be either 84 and 85, or 4A and 4B.

T608M Time-out Option Table #3. Index in this table to T608M byte one which sets the duration for message waiting stutter dial tone.

Step	*Reference*
15. Forward POTS telephones to the VoiceMemo directory number with RC 141. - Select the condition for forwarding, most likely "Divert if Busy or No Answer." - Select "VMS" as the Destination Type.	
16. Tell users with FeaturePhones to forward their phones to the VoiceMemo DN.	
17. Force the E & M trunks out of service and put them back into service using Maintenance mode.	
18. Instruct users to dial the "dummy" extension and enter their mailbox number when they wish to retrieve their messages. Users should not dial the VoiceMemo directory number.	

Configure Fujitsu Starlog Integration

VoiceMemo Release 5.03 and later

This procedure summarizes the steps required to install and configure the Enhanced In-band Integration feature to work with the Fujitsu Starlog PBX. Refer to the appendixes for reference information about this integration.

There are two sections to installing this integration: installing and configuring the VoiceMemo software, and configuring the Fujitsu Starlog PBX. Refer to your Starlog documentation for help when configuring the PBX, if necessary.

Step	*Reference*
Configure the VoiceMemoSystem	
1. Install the Enhanced In-band Integration optional feature diskette.	OP 5402
2. Define a line group for the integration.	OP 6028
3. Assign the Enhanced In-Band Integration application to the line group.	OP 7006
4. Select the Starlog integration application for the line group.	OP 7010
5. If your VoiceMemo system has Release 5.03 software, set the number of in-band tasks per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required number of tasks.	OP 7016
6. Refer to the Task List in your *VoiceMemo Reference and Configuration Manual* to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu.	
- Schedule Company Greetings	
- Enable Call Placement Message Delivery	
- Configure for Transfer to System Attendant	
- Define an Administrator's Mailbox	
- Define an Attendant's Mailbox	
- Configure Passcode Parameters	
- Enable Dial-by-Name	
- Set a default language for the line group	
- Enable multiple messages for outside callers	

Step	*Reference*

7. Set the following phone line exceptions for each line in the line group: — DP 7022

Exception	Value	Description
3	2	Dial Tone Detect Time
9	20	Ringing Timeout
25	Y	Enable DTMF Column 3
14040		Loop Break Detect Time
14490		In-ring Off Time
148	3	In-ring On Time Low
152	1500	In-ring Minimum Power
1648		DTMF Output Duration
1762		DTMF Output Level

Note: If the VoiceMemo system has the Receptionist II optional feature, the Ringing Timeout (line exception 9) must be 3 seconds *less* than the switch's Ring No Answer timer.

8. If desired, add feature bit 017 to users' FCOS's to reduce the amount of time that the VoiceMemo system waits before clearing a port after an undetected caller hangup. — DP 5011

9. If desired, add feature bits 161 and 162 to users' FCOS's, and have users activate their conditional greetings. — DP7023

10. If your AIP VoiceMemo system has the Receptionist II optional feature installed, enable it from the online menus, then define the extension numbers for the Receptionist II ports. Set the Receptionist Dial String to +#++. — DP6034

11. Create a second line group and configure it for DTMF-to-PBX message waiting, or configure a serial port for RS-232 message waiting. See the *VoiceMemo Reference and Configuration Manual* for details.

    Set the following line exceptions for DTMF-to-PBX message waiting:

Exception	Value	Description
6	Off	DTMF Detect Enable
164	8	DTMF Output Duration
176	2	DTMF Output Level

Configure the Fujitsu **Starlog** PBX

1. Cross-connect phone lines from Starlog PBX 8SLC cards to the VoiceMemo system phone ports.

2. Connect the Starlog and VoiceMemo systems to same ground point. — DP 3021

Step	*Reference*

3. CMC 102: Set the following system parameter flags to the indicated values:

FLGN	Value	Description
2	1	OPS ring pattern = station ringing (1s on, 3s off)
15	1	Enable message waiting for all 500/2500 sets
49	10	Send filler digit (0) to VoiceMemo when required
109	1	Enable called party auto-disconnect on hangup
110	1	Enable stutter dial tone if no message waiting lamp
111	0	Set voice mail integration pattern zero (0)
112	3 or4	Set to extension length on PBX; if mixed length, set to 4
136	1	Set standard busy tone

4. CMC 104: Define a class of service for the VoiceMemo ports. Allow any required trunk group access. Include feature number 87.

5. CMC 104: Include feature number 89 in the classes of service for all VoiceMemo users.

6. CMC 200: Assign a phantom station for use as a VoiceMemo pilot number. Use an easy-to-remember number for this station.

7. CMC 201: Set each message waiting port as an originate-only port (I'2 =2).

8. CMC 204: Set P3=1 for each VoiceMemo port to disable distinctive ringing.

9. CMC 204: Set P4=1 for each 500/2500 set with a message waiting lamp.

10. CMC 206: Set P4 =1 for the VoiceMemo lines that are used for message waiting. Include the ACD pilot if you have placed the VoiceMemo ports in an ACD.

11. CMC 251: Set the trunk directory numbers to all zeros (P3=0000) on all trunks that can reach VoiceMemo.

12. CMC 254: Lengthen the duration of DTMF sending to 128 milliseconds as follows:
    P1 = o
    P2 = 10
    P3 = 2

13. CMC 301: Create a circular hunt group that contains all of the phone lines connected to the VoiceMemo system. You must include the message waiting line(s) to allow the message waiting return call to reach the hunt group.

14. CMC 308: Build an ACD group consisting of the phantom pilot and only those lines assigned to the Enhanced In-band Integration. Do not include the message waiting ports.

15. Forward VoiceMemo user telephones to the phantom extension.

Configure AT&T System 25 Integration

VoiceMemo Release 5.03 and later

This procedure summarizes the steps required to install and configure the Enhanced In-band Integration optional feature to work with the AT&T System 25 PBX. Refer to the appendixes for reference information about this integration.

After completing the steps below, you will need to program your switch to pass in-band call information to the AIP VoiceMemo system. Refer to your PBX manual for additional information.

Step	*Reference*
1. Install the Enhanced In-band Integration optional feature diskette.	DP 5402
2. Define a line group for the integration.	DP 6028
3. Assign the Enhanced In-Band Integration application to the line group.	DP 7006
4. Select the AT&T System 25 application for the line group.	DP 7010
5. If your VoiceMemo system has Release 5.03 software, set the number of in-band tasks per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required number of tasks.	DP 7016
6. Refer to the Task List in your *VoiceMemo Reference and Configuration Manual* to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu. - Schedule Company Greetings - Enable Call Placement Message Delivery - Configure for Transfer to System Attendant - Define an Administrator's Mailbox - Define an Attendant's Mailbox - Configure Passcode Parameters - Enable Dial-by-Name - Set a default language for the line group - Enable multiple messages for outside callers	Menu Map 13
7. Exit and save your changes.	
8. Configure either RS-232 Message Waiting or DTMF-to-PBX Message Waiting. *See your VoiceMemo Reference* and *Configuration* Manual for details.	
9. Cross-connect phone lines from the System 25 to the VoiceMemo phone ports.	
10. Connect the System 25 and VoiceMemo system to same ground point.	DP 3021

Configure Northern Telecom Norstar Integration

VoiceMemo Release 5.03 and later

This procedure summarizes the steps required to install and configure the Enhanced In-band Integration feature to work with the Northern Telecom Norstar KSU. Refer to the appendixes for reference information about this integration.

There are two sections to installing this integration: installing and configuring the VoiceMemo software, and configuring the Norstar. Refer to your Norstar documentation for help when configuring the switch, if necessary.

Step	*Reference*
Configure the VoiceMemo System	
1. Install the Enhanced In-band Integration optional feature.	DP 5402
2. Define a line group for the integration.	DP 6028
3. Assign the Enhanced In-Band Integration application to the line group.	DP 7006
4. If your VoiceMemo system has Release 5.03 software, set the number of in-band tasks per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required number of tasks.	DP 7016
5. Select the Norstar template set.	Dl? 7010
6. Use the Edit Templates option to modify the Data field in templates 2 and 3. The Data field for template 2 must contain the prefix digit used by your switch (if any) and the pilot number of the hunt group of VMI lines. The Data field for template 3 must contain the prefix digit (if any) and "d3" which means to expect a fixed-length extension of three digits. Alternatively, you can use Xl in place of the prefix digit in the Data field. This causes the VoiceMemo system to ignore one digit. The system still expects a digit (the prefix digit) from the Norstar, but it will accept any digit.	DP 7011

Step	*Reference*
7. Refer to the Task List in your *VoiceMemo Reference and Configuration Manual* to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu. - Schedule Company Greetings - Enable Call Placement Message Delivery - Configure for Transfer to System Attendant - Define an Administrator's Mailbox - Define an Attendant's Mailbox - Configure Passcode Parameters - Enable Dial-by-Name - Set a default language for the line group - Enable multiple messages for outside callers	Menu Map 13
8. Set the following phone line exceptions for each line in the line group: Exception 23, Value 60, Description: Flash-hook Time Exception 32, Value 24, Description: DTMF Receive Debounce Time Exception 166, Value 70, Description: Interdigit Delay Time	DP 7022
9. If your VoiceMemo system has the Receptionist II optional feature, set the Pre-DN dial string to S+*70 for blind transfers. The Compact and Modular DR2 do not support supervised transfers over the VMI lines. If you have a Norstar DR3 or DR4 and want to use supervised transfer, set the Pre-DN dial string to S+2, set the Connect Dial String to S+*3, and set the Dial Suing for Return on Called Party Busy or RNA to S+2. See your *Receptionist II Manual* for details.	
10. Exit and save your changes.	
11. If the systems are near each other, connect the switch and VoiceMemo systems to the same ground point.	DP 3021
12. Configure a line group for DTMF-to-PBX Message Waiting with the following values: Pre-DN On Dial String = S+*1 Pre-DN Off Dial String = S+#1 *See* your *VoiceMemo Reference* and *Configuration Manual* for procedures on configuring DTMF-to-PBX Message Waiting.	

Step *Reference*

Configure the Northern Telecom **Norstar**

1. Install VMI modules for all integration lines as instructed in the *Norstar* Voice Mail *Interface* Installation *Guide*. Connect lines from the Line Jacks on the VMIs to available telephone ports on the KSU. Connect lines from the Terminal Jacks on the VMIs to line card ports on the VoiceMemo system. Plug in the power supplies for the VMIs. Mount the VMIs on the wall after connecting them to both the KSU and the VoiceMemo system.
2. Install ATAs or additional VMIs for all VoiceMemo system outdial ports, including any used for DTMF-to-PBX message waiting.
3. Use an M7310 or M7324 telephone to determine the feature codes assigned to each VMI. (The KSU automatically assigns feature codes to each VMI and assigns intercom numbers (DNs) to each VMI line.)
4. Use the VMI feature codes to determine the intercom numbers assigned to each VMI line.
5. For Compact DR2 and Modular DR2 systems, ensure that each VMI DN is configured as follows:

   Under Permissions:

Held Line Reminder =	YES
Full Handsfree =	NO
Handsfree Answerback =	NO
Pick Up Group =	NO
Paging Zone =	NO

   Under Line Access:

   Intercom line is assigned as the prime line.

Step *Reference*

6. For Modular DR3 and DR4 systems, ensure that each VMI DN is configured as follows:

   Under Permissions/Capabilities:

Set Lock =	NONE
Full Handsfree =	NO
Handsfree Answerback =	NO
Pick Up Group =	NO
Page Zone =	NO
Auxiliary Ringer =	NO
Hotline =	NO
Priority Call =	NO

   Under Line Access:

Answer DN =	NO
Line Pool Access =	NO (If a line will be used for outdialing, set to YES.)

   Two intercom lines are assigned, with one assigned as the prime line.

7. Program the first VMI DN to call forward for both busy and no answer conditions to the second VMI DN. Program the second VMI DN to call forward to the third VMI DN, and so on. Program the last VMI DN to call forward to the first VMI DN. This will ensure an efficient use of ports for both systems.

8. Program any DNs used for message waiting indication to call forward all calls to the first VMI DN in the Enhanced In-band line group. This will allow users to press the message key on their phones and be connected to the Enhanced In-band line group.

9. Program the following translation codes (L = link or flash):

Set message waiting =	L*1
Cancel Message Waiting =	L#1
Call Transfer =	L*70
Forward Prefix =	6
Disconnect Code =	(clear this field)

   Note: The default Disconnect Code is a dial tone, which means that the Norstar will return dial tone to the VoiceMemo port when a caller hangs up. You may want to set this code to 9 for integration ports without Receptionist II software, or ## for ports with Receptionist II. Both of these codes tell the VoiceMemo system to end a call session.

10. Program all user phones to call forward on both busy and no answer conditions to the first VMI DN.

Configure AT&T Legend Integration

VoiceMemo Release 5.03 and later

This procedure summarizes the steps required to install and configure the Enhanced In-band Integration optional feature to work with the AT&T Legend PBX.

After completing the steps below, you will need to program your switch to pass in-band call information to the AIP VoiceMemo system. Refer to your PBX manual for additional information.

Step	*Reference*
1. Install the Enhanced In-band Integration optional feature diskette.	DP 5402
2. Define a line group for the integration.	DP 6028
3. Assign the Enhanced In-Band Integration application to the line group.	DP 7006
4. Select the AT&T Legend application for the line group.	DP 7010
5. If your VoiceMemo system has Release 5.03 software, set the number of in-band tasks per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required number of tasks.	DP 7016
6. Refer to the Task List in your *VoiceMemo Reference and Configuration* Manual to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu. - Schedule Company Greetings - Enable Call Placement Message Delivery - Configure for Transfer to System Attendant - Define an Administrator's Mailbox - Define an Attendant's Mailbox - Configure Passcode Parameters - Enable Dial-by-Name - Set a default language for the line group - Enable multiple messages for outside callers	Menu Map 13
7. Exit and save your changes.	
8. Configure either RS-232 Message Waiting or DTMF-to-PBX Message Waiting. *See* your *VoiceMemo Reference and Configuration Manual* for details.	
9. Cross-connect phone lines from the Legend to the VoiceMemo phone ports.	
10. Connect the Legend and VoiceMemo system to same ground point.	DP 3021

Configure Northern Telecom MTX Integration

VoiceMemo Release 5.03 and later

This procedure summarizes the steps required to install and configure the Enhanced In-band Integration optional feature to work with the Northern Telecom MTX switch.

After completing the steps below, you will need to program your switch to pass in-band call information to the AIP VoiceMemo system. Refer to your PBX manual for additional information.

Step	*Reference*
1. Install the Enhanced In-band Integration optional feature diskette.	DP 5402
2. Define a line group for the integration.	DP 6028
3. Assign the Enhanced In-Band Integration application to the line group.	DP 7006
4. Select the Northern Telecom MTX application for the line group.	DP 7010
5. If your VoiceMemo system has Release 5.03 software, set the number 'of in-band tasks per module to 20% of the number of in-band ports in each module. If your system has Release 5.04 software, the system automatically configures the required number of tasks.	DP 7016
6. Refer to the Task List in your *VoiceMemo Reference and Configuration Manual* to find procedures to configure any of the options below for the integration line group. You can reach these options by selecting Other Features from the online Enhanced In-band Menu.	Menu Map 13
- Schedule Company Greetings - Enable Call Placement Message Delivery - Configure for Transfer to System Attendant - Define an Administrator's Mailbox - Define an Attendant's Mailbox - Configure Passcode Parameters - Enable Dial-by-Name - Set a default language for the line group - Enable multiple messages for outside callers	
7. Exit and save your changes.	
8. Configure either RS-232 Message Waiting or DTMF-to-PBX Message Waiting. *See* your *VoiceMemo Reference* and *Configuration Manual* for details.	
9. Cross-connect phone lines from the MTX to the VoiceMemo phone ports.	
10. Connect the MTX and VoiceMemo system to same ground point.	DP 3021

Connect the Chassis Ground to the Rack-Mount VoiceMemo System

VoiceMemo Release 5.03 and later

This procedure describes how to connect the chassis ground of a telephone switch to the rack-mount AIP VoiceMemo system.

DANGER!

A Make sure that all power to the system has been disconnected prior to performing this procedure. Failure to do so can cause injury!

Step	*Reference*

1. Locate the grounding stud on the VoiceMemo cooling assembly.
2. For non-central office applications, connect a single strand of 12 gauge wire from the X_0 ground point to the cooling assembly grounding screw. (Note: The connector must be crimped, not soldered.) See figure 1 for details.
3. For Central Office applications, connect a single strand of 14 gauge wire from the X_0 ground point to the cooling assembly grounding screw. (Note: The connector must be crimped, not soldered.

Note: Impedance betweenn the AIP VoiceMemo system and the attached equipment or master ground bar should be less than 1 ohm at zero volts. The maximum acceptable current is 0.1 amps (RMS) when all telephone lines are idle.

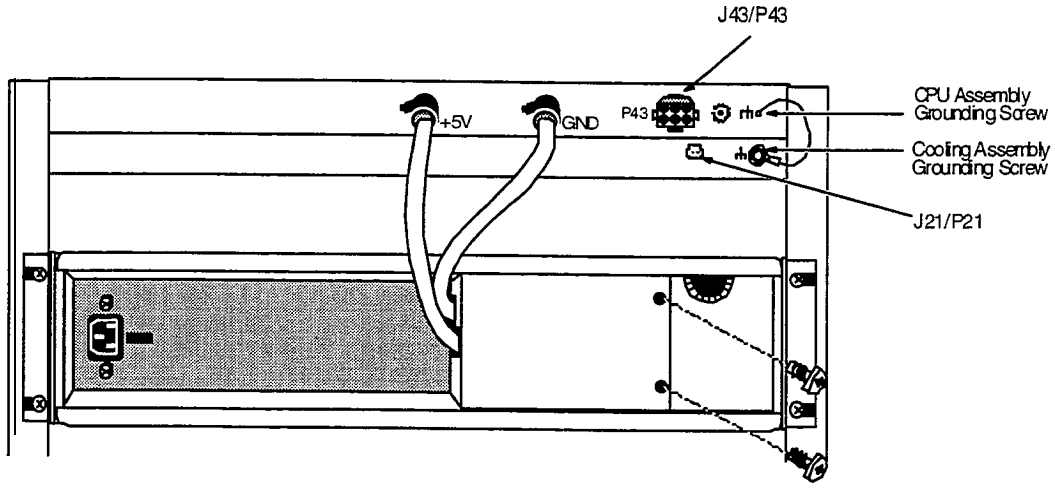


Figure 1 **VoiceMemo** System Ground location

Install Optional Feature With System Online

VoiceMemo Release 5.04A and later

The procedure describes how to install an optional feature with the system online. Be sure the Optional Feature Diskette(s) and the Module Enable Diskette contain the serial number(s) for all disk(s) in the system.



CAUTION!

If you are loading a revision support disk (RSD), do it after completion of this procedure. Loading the RSD first, could create an incorrect configuration.



WARNING!

This process causes the system to automatically reboot, resulting in an interruption to call processing. Centigram recommends that you perform this procedure during periods of low call traffic.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the System Maintenance Additional Options Menu.	Menu Map 12.

2. Select the add optional feature program.

   Select: (A) Add Extra Cost Feature(s)
   Prompt: `WARNING. Adding extra cost features here will result in a complete system shutdown followed by a system restart.`
   `Enter 'Y' to add extra cost features, 'N' to stop:`
   Response: Y

3. Install the optional feature.

   Prompt: `Insert extra cost floppy disk in the floppy drive`
   `Enter any key when ready:`
   Response: Insert diskette, press Enter.

4. Following the installation the system prompts for another optional feature to be installed.

   Prompt: `Do you want to install another` extra cost feature?
   Response: Y to install another feature and continue from step 3,
   N to exit.

   The system automatically shuts down and resets the entire system. The system automatically edits and saves the configuration files, then returns to the VoiceMemo Configuration Offline Menu.

5. Make the necessary system configuration changes, if necessary, per the instructions provided with the optional feature documentation.

Step	Reference

6. Exit the VoiceMemo Configuration Offline Menu. The system will perform a system shutdown.

   Prompt: Wait for message waiting queues to be empty?
   Response: Y to wait for the queue to clear,
   N to continue immediately with the shutdown.

   The system then completes the shutdown and activates the software, returning to the System Maintenance - Additional Options Menu.

Perform an Online Optional Feature Installation

VoiceMemo Release 5.04A and later

The procedure describes how to install an optional feature with the system online. Be sure the Optional Feature Diskette(s) and the Module Enable Diskette contain the serial number(s) for all disk(s) in the system.



WARNING!

This process causes the system to automatically reboot, resulting in an interruption to call processing. Centigram recommends that you perform this procedure during periods of low call traffic.

Step	*Reference*
1. Reach the System Maintenance Menu, then go to the System Maintenance Additional Options Menu.	Menu Map 12
2. Select the add optional feature program. *Select:* (A) Add Extra Cost Feature(s) *Prompt:* *WARNING.* Adding extra cost features here will result in a complete system shutdown followed by a system restart. Enter 'Y' to add extra cost features, 'N' to stop: *Response:* Y	
3. Install the optional feature. *Prompt:* Insert extra cost floppy disk in the floppy drive Enter any key when ready: *Response:* Insert diskette, press Enter.	
4. Following the installation the system prompts for another optional feature to be installed. *Prompt:* Do you want to install another extra cost feature? *Response:* Y to install another feature and continue from step 3, N to exit. The system automatically shuts down and resets the entire system. The system automatically edits and saves the configuration files, then returns to the VoiceMemo Configuration Offline Menu.	
5. Make the necessary system configuration changes, if necessary, per the instructions provided with the optional feature documentation.	

Step	*Reference*
6. Exit the VoiceMemo Configuration Offline Menu. The system will perform a system shutdown. *Prompt:* Wait for message waiting queues to be empty? *Response:* Y to wait for the queue to clear, N to continue immediately with the shutdown. The system then completes the shutdown and activates the software, returning to the System Maintenance - Additional Options Menu.	

Define a Line Group for Applications

VoiceMemo Release 5.03 and later

This procedure describes how to define a line group for an application.

Step	*Reference*
1. Reach the VoiceMemo Configuration Offline Menu.	Menu Map 2

CAUTION!

A 

You may want to copy the active configuration to ensure that the inactive configuration reflects the configuration that is currently operating.

2. If desired, duplicating the configuration.

   Select: (B) Duplicate Active Configuration
   Response: The system copies the current (active) configuration. When copying is completed, the short form of the Offline Menu appears.

   All subsequent steps in this procedure – along with any other configuration entries – affect just the copy, and take effect only after you activate the configuration.

3. Go to the Line Groups Menu. Enter the requested information, as described in the following steps, from your completed worksheet. — Menu Map 2

4. Specify the line group number.

   Select: (G) Current Group
   Prompt: Enter a group number =
   Response: Number of the line group (l-24) to be used for the application.

5. Name the line group.

   Select: (N) Name of current group
   Prompt: Enter group name =
   Response: Descriptive name of the application line group.

Step	*Reference*

6. Add the desired lines.

   Select: (A) Add Lines to Current Group
   Prompt: Enter lines to add =
   Response: In a single-module system, the line card number (O-l 5) and port designator (A or B) to add to the line group. Any of the formats shown in the following examples are valid:

Example	*Specifies*
1:*	All lines
o-15	All lines
o-2	Lines OA, OB, 1A, 1B, 2A, and 2B
1B-4	Lines 1B, 2A, 2B, 3A, 3B, 4A, and 4B
1A,2A,4A	Lines 1A, 2A, and 4A
2	Lines 2A and 2B

   In a multi-module system, the module number (1-4), line card number (O-l 5), and port designator (A or B) to add to the line group. Any of the formats shown in the following examples are valid:

Example	*Specifies*
2:*	All lines in module 2
2:0-2	Lines OA, OB, 1A, 1B, 2A, and 2B in module 2
2:1B-4	Lines 1B, 2A, 2B, 3A, 3B, 4A, and 4B in module 2
1,2	All lines in modules 1 and 2

7. Drop any lines that should not be part of the line group.

   Select: (D) Drop Lines From Current Group
   Prompt: Enter lines to drop =
   Response: Line(s) to remove from the line group; values and formats are the same as described above for adding lines.

8. Exit to the VoiceMemo Configuration Offline Menu.

Assign the Enhanced In-band Integration Application to a Line Group

VoiceMemo Release 5.03 and later

This procedure describes how to assign the Enhanced In-band Integration application to a line group. You must have first defined a line group (DP 6028).

Step	*Reference*
1. Reach the VoiceMemo Configuration Offline Menu.	Menu Map 13
2. From the Offline Menu, go to the LineGroup Only Applications Menu.	Menu Map 13
3. Assign the Enhanced In-band Integration application to the line group. Select: (G) Group Selected *Prompt:* Enter a group number = *Response:* If the current line group number is the one you want, press Enter; otherwise, enter the line group number for the application you are assigning. *Prompt:* APPL (G,U,D,E,M,P,R,V,W,X): *Response:* E for Enhanced In-baud Integration.	
4. Exit and save your changes. Select: (X) Exit Prompt: G, M, C, Q, X *Response:* Exit and save.	

Modify an Enhanced In-band Integration Application

VoiceMemo Release 5.03 and later

This procedure explains how to modify all of the components of an Enhanced In-band Integration application. Besides instructions for modifying the individual components of a template, it includes instructions for changing the inter-digit timeout and the error action without using the edit templates menu. You can change any or all of the values for an application or template. The changes will take effect after you exit from the online menu.

You should always save your application after making any changes. The instructions to save your application begin at step 20.

Step	*Reference*
1. Reach the VoiceMemo Configuration Offline Menu.	Menu Map 13
2. Select the Enhanced In-band Integration line group.	
3. Reach the second Enhanced In-band Menu (Configure Application).	Menu Map 13

Set Name and Description

4. If desired, enter a new name for the integration application.

   Select: (A) Application Name
   Prompt: Enter application name: =
   Response: Up to 10 characters as a name for the application. The application will be stored on the disk using this name.

   Note: If you are modifying one of the default applications, you must change the name in order to save your changes. You cannot overwrite a default application using the same name.

5. Enter a new description for the application.

   Select: (B) Application Description
   Prompt: Enter application description
   Response: Up to 128 characters as a description of the application.

Modify Default Parameters

6. Reach the Edit Parameters Menu. — Menu Map 13

7. Change the default maximum wait between digits.

   Select: (A) Maximum wait for a digit (1/10 seconds)
   Prompt: Timeout =
   Response: The number (10ths of a second) that the system should wait between incoming digits before determining that an error has

Step | *Reference*

8. Change the default error action.

   Select: (B) Error Action if digits missing
   Prompt: Error Action =
   Response: 1 to cause the system to hang up,
   2 to play a general greeting.

9. Exit to the Enhanced In-band Menu

   Select: (X) Exit

Modify Templates

10. Reach the In-band Edit Template Menu. — Menu Map 13

11. Select a template to edit.

    Select: (A) Current Template
    Prompt: Current Template =
    Response: The number of the template to edit.

12. Enter the switch data to match.

    Select: (B) Data
    Prompt: Data =
    Response: Characters that describe the in-band signaling that this template is to match. Table 1 at the end of this procedure lists all valid characters.

13. Enter the action to perform when the data is received.

    Select: (C) Action
    Prompt: Action =
    Response: Characters that describe the action to perform when this template matches the data entirely. Table 2 at the end of this procedure lists all valid action characters.

14. Enter the next templates, if any, to compare against incoming data.

    Select: (F) Next Templates
    Prompt: Next Templates =
    Response: The numbers of the template to match against further incoming data.

15. Enter the time out value.

    Select: (D) Timeout
    Prompt: Timeout =
    Response: The number (1 Oths of a second) that the system should wait between incoming digits before determining that an error has occurred.

Step | *Reference*

16. Enter the error action to perform if a timeout occurs or if the data does not completely match any templates.

    Select: (E) Error Action
    Prompt: Error Action =
    Response: Characters that describe the error action to perform. Table 2 at the end of this procedure lists all valid action characters.

17. Enter a description for the template.

    Select: (C) Comment
    Prompt: Comment =
    Response: Characters that describe the function of the template.

18. Repeat any of steps 11 through 17 for each template that you need to modify.

19. Exit to the Enhanced In-band Menu

    Select: (X) Exit

Check Your Work and Save the Application

20. Compare your templates with your worksheet to verify your work.

    Select: (0) Show Application
    Response: The system scrolls all of the templates in the application onto the console screen. If any of the information does not match your worksheet, select the template and make the necessary changes.

21. Backup (save) the application.

    Select: (H) Backup Application (Release 5.03 systems) or
    (S) Save Application (Release 5.04 systems)
    Prompt: Do you want to overwrite existing copy?
    Response: **Y**
    Prompt: Application backed up

22. Press X to return to the Online configuration menu.

23. Press X again to save your changes and exit.

Set In-band Module Numbers and Number of Tasks

This procedure describes how to set the number of in-band tasks for each module that has in-band integration ports.

Note: You do not need to perform this procedure on a Release 5.04 system.

Step	Reference
1. Reach the Linegroup Only Applications menu.	Menu Map 13
2. Select the line group that you defined for your Enhanced In-band application.	
3. Select Enhanced Inband to reach the Inband Integration Menu.	
4. Select a module for the in-band integration ports. Select: (F) Host number *Prompt:* Host number for Inband = *Response:* Enter a module number (1-4).	
5. Set the number of in-band tasks to run on that module. Select: (G) Number of Inband Tasks on this host *Prompt:* Number of Inband Tasks on this host (1-16) = *Response:* Enter the number of tasks (1- 16) to run on the specified module.	
6. Repeat steps 4 and 5 for all modules with in-band integration ports.	

Add or Cancel a Phoneline Exception

VoiceMemo Release 5.03 and later

This procedure describes how to set any phoneline exception. Phoneline exception changes take effect on the next new call after saving the settings. A table for converting port numbers to line numbers follows the procedure.

Step	*Reference*

Add a Phoneline Exception

1. Reach the Phoneline Exceptions Menu. — Menu Map 10
2. Select line to change.

   Select: (A) Add exception
   Prompt: line to change =
   Response: The line number to change. The valid entries are 1 - 112.

3. Select the exception number to set.

   Prompt: command =
   Response: The exception number.

4. Enter the new value for the exception.

   Prompt: value =
   Response: The desired new value.

5. Repeat steps 3 and 4 until all the phoneline exceptions for the selected line are set. When you are finished, press Enter.
6. Select a new line to change or press Enter to finish.

Cancel a Phoneline Exception

1. To return a phoneline exception to the default value, reach the Phoneline Exceptions Menu. — Menu Map 10
2. Select a line to change.

   Select: (C) Cancel exception.
   Prompt: line to change =
   Response: The line number to change.

3. Select the phoneline exception to reset.

   Prompt: command to cancel =
   Response: The number of the phoneline exception to reset

4. Repeat steps 8 and 9 for each phoneline exception you want to change. When you are finished, press Enter.
5. Enter the next line to be changed, or press Enter to exit.

Step *Reference*

Port Number to Line Number Conversion

Port Number	Module 1 Line Number	Module 2 Line Number	Module 3 Line Number	Module 4 Line Number
0A	0	32	64	96
0B	1	33	65	97
1A	2	34	66	98
1B	3	35	67	99
2A	4	36	68	100
2B	5	37	69	101
3A	6	38	70	102
3B	7	39	71	103
4A	8	40	72	104
4B	9	41	73	105
5A	10	42	74	106
5B	11	43	75	107
6A	12	44	76	108
6B	13	45	77	109
7A	14	46	78	110
7B	15	47	79	111
8A	16	48	80	112
8B	17	49	81	113
9A	18	50	82	114
9B	19	51	83	115
10A	20	52	84	116
10B	21	53	85	117
11A	22	54	86	118
11B	23	55	87	119
12A	24	56	88	120
12B	25	57	89	121
13A	26	58	90	122
13B	27	59	91	123
14A	28	60	92	124
14B	29	61	93	125
15A	30	62	94	126
15B	31	63	95	127

Enable Conditional Greetings

VoiceMemo Release 5.03 and later

This procedure details the process for enabling conditional greetings. Conditional greetings are used to identify, to the caller, why they have reached the VoiceMemo system (busy, no answer, etc). Mailbox owners perform this procedure from their own telephone sets. Users can either keep the prerecorded greetings or record custom greetings in their own voice.

Note: FCOS bit 161 must be enabled before mailbox owners can record or use conditional greetings.

Step	*Reference*
1. Call the VoiceMemo system extension.	
2. Enter your password to log into the system.	
3. Press U for user options.	
4. Press G for greeting modification	
5. Press E to enable conditional greetings.	
6. Press C to change (record) conditional greetings.	
7. After making any desired changes to conditional greetings, press X to exit the system.	

Create a New Enhanced In-band Integration

VoiceMemo Release 5.03 and later

This procedure is a short tutorial in creating your own Enhanced In-band application It leads you through the steps to create all of the templates required to integrate with an AT&T System 25 switch.

By following the basic steps of this procedure, you can create a set of templates for integration with any switch that can pass in-band signaling. There is a worksheet in the back of this manual to help you plan your templates. You need to know the format of the in-band information packets sent by your switch. After you have created all of the templates, you must program the switch to pass in-band information to the AIP VoiceMemo system.

The System 25 recognizes four call types: direct, direct trunk, internal forwarded and external forwarded. Each call type needs a template to interpret the incoming data. Call type identifiers are prepended to the digit stream and sent to the VoiceMemo system along with the caller and calling party identification.

Step	*Reference*
1. Reach the VoiceMemo Configuration Online Menu.	Menu Map 13
2. Select the line group that you defined for your Enhanced In-band application.	
3. Select to modify the application to reach the Enhanced In-band Menu.	
4. Choose to configure the application to reach the second Enhanced In-band Menu.	
5. List the available applications. *Select:* (L) List Applications *Response:* The system presents a list of all Enhanced In-band Integration applications that are loaded on the system.	
6. Choose an application to install that only has a few templates, such as the Norstar integration application. *Select:* (I) Install Application *Prompt:* Application name to install *Response:* **NORSTAR**	

Define a New Application

7. Enter a name for the integration application. *Select:* (A) Application Name *Prompt:* Enter application name: = *Response:* AT&T25	
8. Enter a description for the application.	

Step *Reference*

Select: (B) Application Description
Prompt: Enter application description
Response: AT&T System 25 Test Application

Define the "Incoming Call" Template

9. Go to the Edit templates menu.

   Select: (C) Edit Templates Menu

10. Set the current template to 1 .

    Select: (A) Current Template
    Prompt: Current Template =
    Response: 1

11. Define the data that Template 1 is to respond to. For Template 1, the data is a ringing signal on a line.

    Select: (B) Data
    Prompt: Data =
    Response: R, detect ringing.

12. Enter the action to perform when the data is received.

    Select: (C) Action
    Prompt: Action =
    Response: T go off-hook

13. Enter the next templates to compare against incoming data.

    Select: (F) Next Templates
    Prompt: Next Templates =
    Response: 2 3 4 5

    There is no time out value and no error action associated with this template.

Define the "Direct Inward Call" Template

14. Select the next template to edit.

    Select: (A) Current Template
    Prompt: Current Template =
    Response: 2

Step | *Reference*

15. Enter the data to match. Template 2 handles the direct inward call-type. It is identified by a "#00#". The call type identifier is followed by a variable-length calling extension and two "#" symbols.

Select: (B) Data
Prompt: Data =
Response: # 00# **sx##**

16. Enter the action to perform when the data is received. The response for this call type is the login prompt, or "V1" greeting.

Select: (C) Action
Prompt: Action =
Response: V1

17. Enter the time out value. For this template the time out is one second.

Select: (D) Timeout
Prompt: Timeout =
Response: 10 (tenths of a second)

18. Enter the error action. This template hangs up if there are any errors.

Select: (E) Error Action
Prompt: Error Action =
Response: H

Define the "Direct Trunk Call" Template

19. Enter the next template to match data against.

Select: (A) Current Template
Prompt: Current template =
Response: 3

20. Enter the data to match. This template handles the direct trunk call. The call type identifier is "#01###".

Select: (B) Data
Prompt: Data =
Response: # **01###**

Step *Reference*

2 1. Enter the action to be performed when the data is received. The general greeting, or "V5" greeting is appropriate.

Select: (C) Action
Prompt: Action =
Response: **V5**

22. Enter the time out value. The time out value for this template is 1 second.

Select: (D) Timeout
Prompt: Timeout =
Response: 10 (tenths of a second)

23. Enter the error action to perform. The error action for this template is to hang up.

Select: (E) Error Action
Prompt: Error Action =
Response: H

Define the "Internal Forward Call" Template

24. Enter the next template to edit.

Select: (A) Current Template
Prompt: Current Template =
Response: 4

25. Enter the data field to match. This template handles internal forwarded calls. The call type identifier is "#02#," followed by the variable-length calling extension (sx) and the variable-length called extension (dx), each terminated with a "#" symbol.

Select: (B) Data
Prompt: Data =
Response: **# 02# sx#** dx#

26. Enter the action to be performed when the data is matched. The Forward All greeting is appropriate for forwarded calls in which the reason (busy, no answer) is not identified.

Select: (C) Action
Prompt: Action =
Response: V2

27. Enter the time out value for the template. The value for this template is 1 second.

Select: (D) Timeout
Prompt: Timeout =
Response: 10 (tenths of a second)

Step *Reference*

28. Enter the error action to perform. The error action for this template is to hang up.

    Select: (E) Error Action
    Prompt: Error Action =
    Response: **H**

Define the "External Forward Call" Template

29. Select the next template to edit.

    Select: (A) Current Template
    Prompt: Current template =
    Response: *5*

30. Enter the data to match. This template handles external forwarded calls. The call type identifier is "#03##" followed by the variable-length destination extension (dx) and a "#" symbol.

    Select: (B) Data
    Prompt: Data =
    Response: **# 03## dx#**

31. Enter the action to perform when the data is matched. The V2 prompt is appropriate in this situation.

    Select: (C) Action
    Prompt: Action =
    Response: V2

32. Enter the time out value. For this template the time out value is 1 second.

    Select: (D) Timeout
    Prompt: Timeout =
    Response: 10 (tenths of a second)

33. Enter the error action to perform if the template fails. As in the templates above, the only error action is to hang up.

    Sekct: (E) Error Action
    Prompt: Error Action =
    Response: H

Check Your Work and Save the Application

34. Exit the Edit Template Menu.

    Select: (X) Exit

Step	*Reference*

35. Compare your templates with your worksheet to verify your work.

    Select: (0) Show Application

    Response: The system scrolls all of the templates in the application onto the console screen. If any of the information does not match your worksheet, select the template and make the necessary changes.

36. Backup (save) the application.

    Select: (H) Backup Application (Release 5.03 systems) or
    (S) Save Application (Release 5.04 systems)

    Prompt: Do you want to overwrite existing copy?

    Response: **Y**

    Prompt: Application backed up

37. Press X to return to the Online configuration menu.

38. Press X again to save your changes and exit.

Appendix A:
Fujitsu **Starlog** Enhanced In-band Integration

This appendix contains supplemental information about integrating an AIP VoiceMemo system with a Fujitsu Starlog PBX. See the Task List for procedures to configure the integration.

Features and Functions

The Starlog PBX uses a hunt group to route internal and external calls to the VoiceMemo system. When the switch sets up a call to the VoiceMemo system, it directs the call to the hunt group pilot. The pilot is a "phantom extension," and is always busy. This forces the call to hunt past the pilot to one of the VoiceMemo ports.

The VoiceMemo extension that controls message wait requests is also part of the hunt group, but it is an originate-only extension. Because it is part of the hunt group, users can place message waiting return calls, which hunts past the message waiting port to the VoiceMemo ports.

Figure A- 1 shows the strategy for Starlog to AIP VoiceMemo integration.

The PBX uses integration pattern 0 to convey calling party identification to the VoiceMemo system. It can identify many different call types in the information packet, and the Starlog Enhanced In-band integration has over 20 templates to recognize all of the different call types. See the template specifications later in this appendix for more details on the different call types.

The AII? VoiceMemo system has three types of message waiting notification that you can use with the Starlog PBX:

- RS-232 Message Waiting (Type 7) – also called Modem Message Waiting, uses an VoiceMemo serial port and an external 1200 baud modem to pass DTMF message waiting requests to the PBX. This does not use a VoiceMemo line port, and is usually the most economical type of message waiting. The limitation with this type of message waiting is that the confirmation tones from the PBX are not passed from the modem back to the VoiceMemo system.

- DTMF-to-PBX Message Waiting (Type 3) – uses VoiceMemo line ports to pass DTMF message waiting requests to the PBX.
- Pager and Message Delivery Message Waiting (Type 5) – uses one or more VoiceMemo line ports to outdial to external paging systems or telephone numbers.

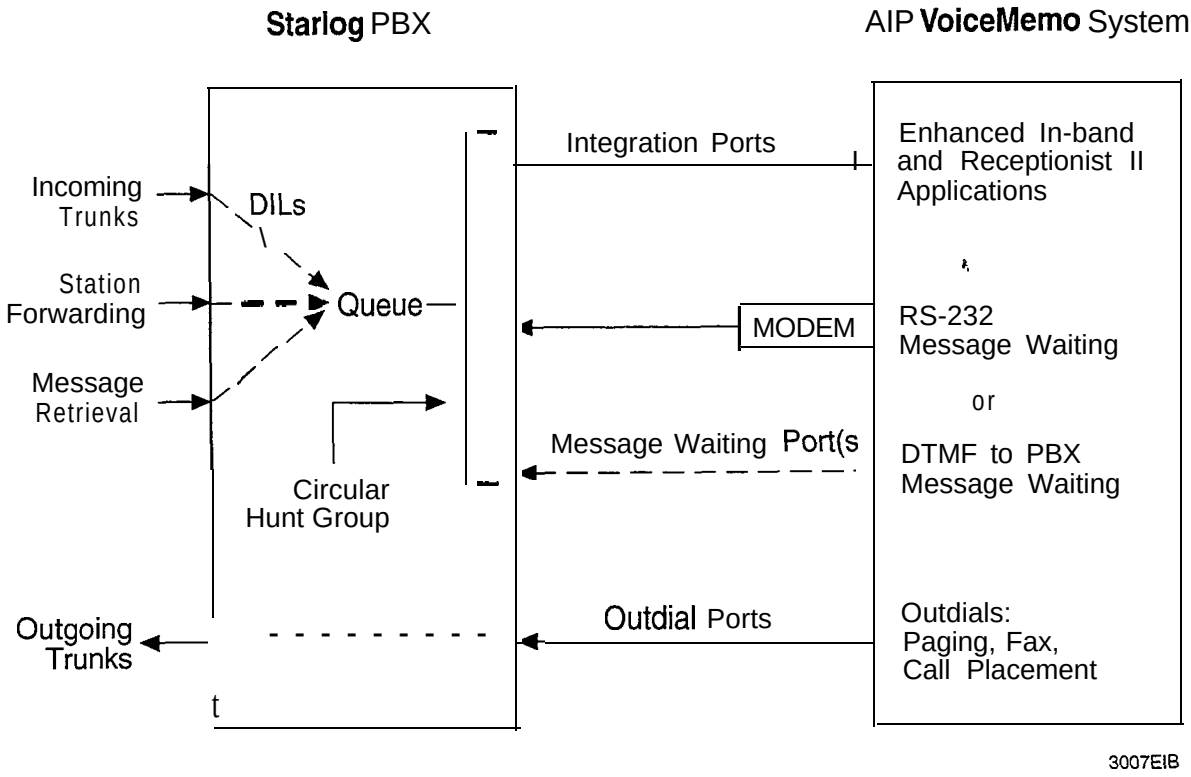


Figure A- 1 **Starlog** to **VoiceMemo** System Integration Structure

Hardware and Software Requirements

The AIP VoiceMemo system software requirements are:

- Release 5.02 or later
- Enhanced In-band Integration optional feature

The VoiceMemo system hardware requirements are:

- One line card port for every incoming phone line
- One serial port for RS-232 message wait control, or one line card port for DTMF-to-PBX message wait control
- Additional line card ports to place any outgoing calls (paging, fax, etc.)

The Fujitsu Starlog software requirements are:

- Feature Package F1 or higher

The Starlog hardware requirements are:

- One (1) 8SLC port per VoiceMemo/Receptionist port
- One (1) 8SLC port for message wait control

Feature Interactions and limitations

- In Starlog systems with three- and four-digit extension numbers, the PBX will insert a lead digit 0 to fill three-digit numbers out to four digits. The EIB software has templates set to accommodate sites with thre&-digit, four-digit, and mixed dialing plans.

- The PBX identifies direct trunk calls by a number which is defined by programming (CMC 251, parameter 3). The VoiceMemo system expects that number to be 0000, and expects the leading digit of three-digit trunk numbers to be 0.

- During a conference call, Starlog electronic telephone sets do not generate the DTMF tones needed to control the VoiceMemo application.

- The Starlog dialtone timeout is quite short — about 5 or 6 seconds. All calls from the VoiceMemo system must start dialing quickly. Avoid using any pauses (+) in the early parts of a dial string.

- It is possible to connect two Starlog switches to a single VoiceMemo system. Call Fujitsu and Centigram for assistance.

Use of Receptionist II

If the VoiceMemo system has the Receptionist II optional feature installed, it can extend a call to an extension which is No Answer Forwarded back to the VoiceMemo ports. The Receptionist II port waits for that call forward to occur, recognizes by an answer tone that it has connected to a VoiceMemo port, and disconnects.

For this forwarding and call recognition to work correctly, you must:

- Program the VoiceMemo system to recognize the extension numbers of the ports running the Receptionist II application (DP 6034).

- Program the VoiceMemo ports to dial a DTMF # when the system identifies a call forwarded from one of its own ports.
- Set line exception 9 for ringing timeout to be greater than the Starlog's Forward No Answer timer.

See the *Receptionist II* Manual for more information about programming for Receptionist II.

VoiceMemo Template Specifications

The Starlog templates have a default inter-digit timeout of 2 seconds and are set to hangup on an error condition. Without actually editing the templates, you can change the inter-digit timeout and the error action by using the Starlog Edit Parameters Menu.

The default templates for Starlog integration are:

```
NAME: STARLOG

      T1: R, T, ,
   Next: 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
         21 22 23
Comment: Wait for ring

      T2: C, , 20, H
   Next: 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
         22 23
Comment: In case we lose 'C'

      T3: 1 0 sx#, V1, 20, H
   Next:
Comment: Direct internal call: Stuffed 0

      T4: 1 sx#, V1, 20, H
   Next:
Comment: Direct internal call: No stuffed digit

      T5: 2 Xx#, V5, 20, H
   Next:
Comment: Direct external call

      T6: 3 0 sx# 0 dx#, V4, 20, H
   Next:
Comment: Busy forwarded call: Stuffed 0 in source and
         destination

      T7: 3 0 sx# dx#, V4, 20, H
   Next:
Comment: Busy forwarded call: Stuffed 0 in source
```

T8: 3 sx# 0 dx#, V4, 20, H
Next:
Comment: Busy forwarded call: Stuffed 0 in destination

T9: 3 sx# dx#, V4, 20, H
Next:
Comment: Busy forwarded call: No stuffed digits

T10: 4 0 sx# 0 dx#, V3, 20, H
Next:
Comment: RNA forwarded call: Stuffed 0 in source and destination

T11: 4 0 sx# dx#, V3, 20, H
Next:
Comment: RNA forwarded call: Stuffed 0 in 'source

T12: 4 sx# 0 dx#, V3, 20, H
Next:
Comment: RNA forwarded call: Stuffed 0 in destination

T13: 4 sx# dx#, V3, 20, H
Next:
Comment: RNA forwarded call: No stuffed digits

T14: 5 0 sx# 0 dx#, V2, 20, H
Next:
Comment: Forward All forwarded call: Stuffed 0 in source and destination

T15: 5 Cl sx# dx#, V2, 20, H
Next:
Comment: Forward All forwarded call: Stuffed 0 in source

T16: 5 sx# 0 dx#, V2, 20, H
Next:
Comment: Forward All forwarded call: Stuffed 0 in destination

T17: 5 sx# dx#, V2, 20, H
Next:
Comment: Forward All forwarded call: No stuffed digits

T18: 8 Xx# 0 dx#, V4, 20, H
Next:
Comment: Busy forwarded external call: Stuffed 0 in destination

T19: 8 Xx# dx#, V4, 20, H
Next:

Comment: Busy forwarded external call: No stuffed digit in destination

T20: 9 Xx# 0 dx#, V3, 20, H
Next:
Comment: RNA forwarded external call: Stuffed 0 in destination

T21: 9 Xx# dx#, V3, 20, H
Next:
Comment: RNA forwarded external call: No stuffed digit in destination

T22: 0 Xx# 0 dx#, V2, 20, H
Next:
Comment: Forward ALL forwarded external call: Stuffed 0 in destination

T23: 0 Xx# dx#, V2, 20, H
Next:
Comment: Forward ALL forwarded external call:No stuffed digit in destination

Appendix B:
Omni Enhanced In-band Integration

This appendix contains supplemental information about integrating an AIP VoiceMemo system with an Omni PBX. See the Task List for procedures to configure the integration.

Features and Functions

The Omni integration operates over standard two-wire E & M trunk circuits. The switch routes direct and forwarded calls to the VoiceMemo application over one group of trunks. The VoiceMemo system sends message waiting requests to the switch over a separate trunk (or group of trunks). The Receptionist II application (if installed) operates on the same line group as the VoiceMemo application.

The PBX uses a hunt group to route station and trunk calls to the VoiceMemo system. All of the trunks in the hunt group are identified as VMS (Voice Mail System) trunks in the switch database. Because they are VMS trunks, the switch sends in-band call information when it routes a call over these trunks.

Direct (message retrieval) calls go through a POTS DN that is permanently forwarded to the VoiceMemo system. The VoiceMemo system recognizes the DN of this "dummy extension" and treats the call as a direct call from the originating DN.

Figure B-l shows the strategy for Omni to AIP VoiceMemo integration.

The Omni integration does allow call transfers from the VoiceMemo system, such as return to operator or to another extension. The switch's ability to recognize a switch-hook flash on tie trunks makes this possible.

The EIB integration software includes two Omni template sets: one for three-digit dialing plans and one for four-digit dialing plans. The Omni integration does not support mixed dialing plans.

The PBX sends different call information messages to the VoiceMemo system for the different types of call forwarding. This allows mailbox owners to use conditional greetings. The forwarded call types are: forward busy, forward no answer, and forward all.

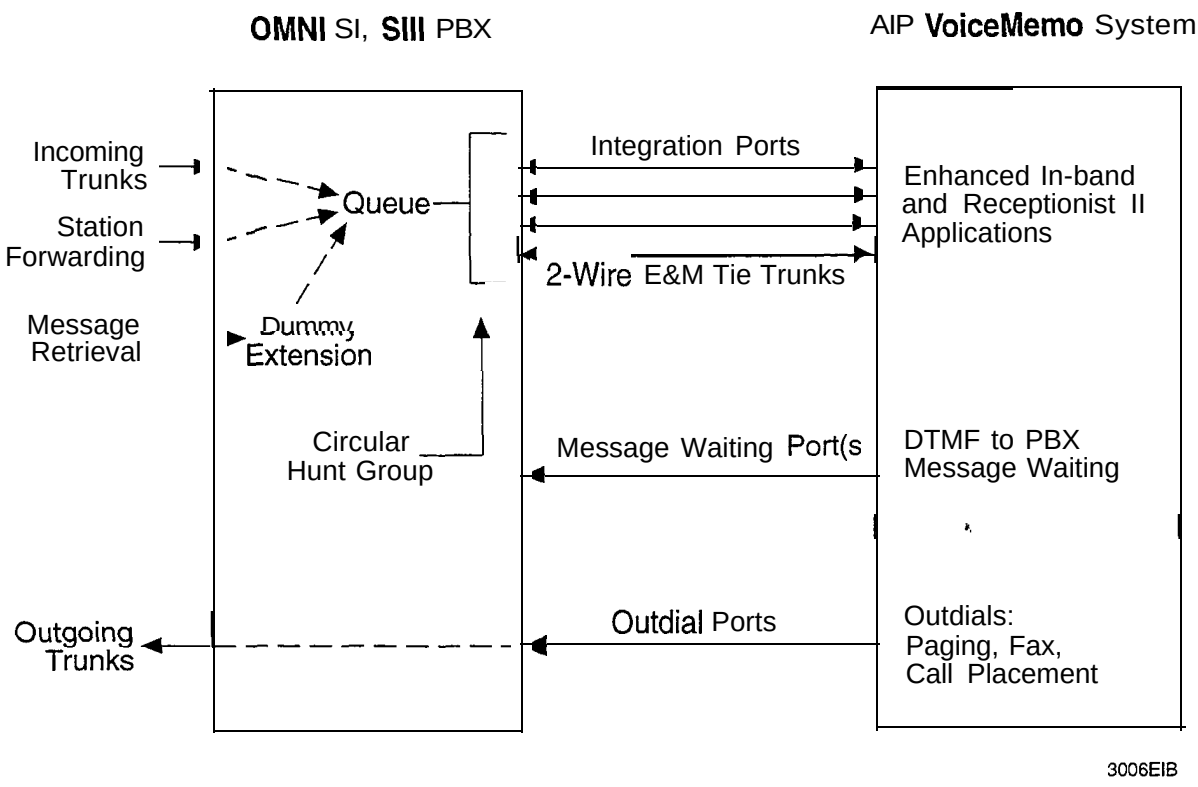


Figure B-I Omni to **VoiceMemo** System Integration Structure

The AIP VoiceMemo system has two types of message waiting notification that you can use with the Omni PBX:

- DTMF-to-PBX Message Waiting (Type 3) – uses VoiceMemo line ports to pass DTMF message waiting requests to the PBX.
- Pager and Message Delivery Message Waiting (Type 5) – uses one or more VoiceMemo line ports to outdial to external paging systems or telephone numbers.

Hardware and Software Requirements

The AIP VoiceMemo system software requirements are:

- Release 5.02 or later
- Enhanced In-band Integration optional feature

The AIP system hardware requirements are:

- One line card port for every incoming phone line

- One line card port for DTMF to PBX message wait control
- Additional line card ports to place any outgoing calls (paging, fax, etc.)

The Omni software requirements are:

- Release 52.40 or later (SI)
- Release 82.40 or 85.10 or later (SIII)

The Omni hardware requirements are:

- One (1) 2-wire E & M trunk per VoiceMemo/Receptionist port
- One (1) 2-wire E & M trunk for message wait control

Feature Interactions and limitations

- Omni FeaturePhones use the Message Leave-feature for message waiting indication. If the Message Leave feature is not programmed, the Omni PBX provides stuttered dial tone. The VoiceMemo system cannot extinguish the message waiting indicator automatically for FeaturePhones, because the switch ignores requests to turn off the indicator. To extinguish the Message Leave button, the user must push the button until "IVMS" shows in the display, then hold the pound (#) key until the phone beeps.

- Standard (POTS) phones receive a stuttered dial tone and/or a light as a message waiting indicator. The VoiceMemo system can turn these indicators on and off through the switch.

- It is possible to connect two Omni switches to a single VoiceMemo system. Call and Centigram for assistance.

use of **Receptionist II**

The Omni PBX allows the optional Receptionist II application to perform supervised transfers. The switch can recognize a switch-hook flash on the tie trunks and return dial tone. The AIP VoiceMemo system then dials the desired DN and monitors the call. The Receptionist II application can also perform blind (unsupervised) transfers.

If the Receptionist II application is operating in supervised mode and extends a call that is forwarded back to the VoiceMemo system, the switch prevents the forwarding and will return busy to the Receptionist II port.

See the Receptionist *II* manual for more information about programming for Receptionist II.

VoiceMemo Template Specifications

The Omni templates have a default inter-digit timeout of four seconds and are set to hangup on an error condition. Without actually editing the templates, you can change the inter-digit timeout and the error action by using the Omni Edit Parameters Menu.

The Enhanced In-band Integration optional feature includes two template sets for Omni integration, one for a three-digit dialing plan and one for a four-digit dialing plan. The default templates for Omni integration with a three-digit dialing plan are:

```
NAME: OMN13
DESCRIPTION: OMNI-3 digit Application by Centigram

     T1: R, , ,
   Next: 2 3 4 5 6 7 8 9 10 11
Comment:

     T2: 02#,T V5,40, H
   Next:
Comment: direct call with no Id

     T3: 03 s3 0# d3 0#, T V4, 40, H
   Next:
Comment: Busy forward

     T4: 04 s3 0# d3 0#,T V3, 40,H
   Next :
Comment: RNA forward

     T5: 05 s3 0# 0000#,T V1, 40, H
   Next:
Comment: Login prompt: 000 is the VMEMO access point (dummy
         extension)

     T6: 05 s3 0# d3 0#, T V2, 40, H
   Next:
Comment: Forward all

     T7: 06 Xx# d3 0#, T V2, 40, H
   Next:
Comment: Message desk Attendent forward

     T8: 07 Xx# d3 0#, T V2, 40, H
   Next:
Comment: Message desk forward     ,
```

T9: 08 Xx# d3 0#, T V4, 40, H
Next:
Comment: Trunk call Busy forward

T10: 09 Xx# d3 0#, T V3, 40, H
Next:
Comment: Trunk call RNA forward

T11: 1Xx# d3 0#, T V3, 40, H
Next:
Comment: Command code 10-16 will have the same greeting

Appendix C:
System 25 Enhanced In-band Integration

This appendix contains supplemental information about integrating an AIP VoiceMemo system with an AT&T System 25. See the Task List for procedures to configure the integration.

Features and Functions

The System 25 integration operates over standard two-wire circuits from Tip and Ring cards. The switch routes direct and forwarded calls to the VoiceMemo application over one group of lines. The VoiceMemo system sends message waiting requests to the switch over a separate line (or group of lines). The Receptionist II application (if installed) operates on the same line group as the VoiceMemo application.

The System 25 integration allows call transfers from the VoiceMemo system, such as return to operator or to another extension. The switch also correctly passes the original called extension number to the VoiceMemo system when a double forward occurs. Although the switch allows all types of call forward (busy, ring no answer, all calls), it only sends one type of call forward message to the VoiceMemo system. Because there is no distinction, mailbox owners cannot use conditional personal greetings.

Figure C-1 shows the strategy for System 25 to AIP VoiceMemo integration.

The AIP VoiceMemo system has three types of message waiting notification that you can use with the System 25:

- RS-232 Message Waiting (Type 7) – also called Modem Message Waiting, uses an VoiceMemo serial port and an external 1200 baud modem to pass DTMF message waiting requests to the PBX. This does not use a VoiceMemo line port, and is usually the most economical type of message waiting. The limitation with this type of message waiting is that any confirmation tones from the PBX are not passed from the modem back to the VoiceMemo system.

- DTMF-to-PBX Message Waiting (Type 3) – uses VoiceMemo line ports to pass DTMF message waiting requests to the PBX.

- Pager and Message Delivery Message Waiting (Type 5) – uses one or more VoiceMemo line ports to outdial to external paging systems or telephone numbers.

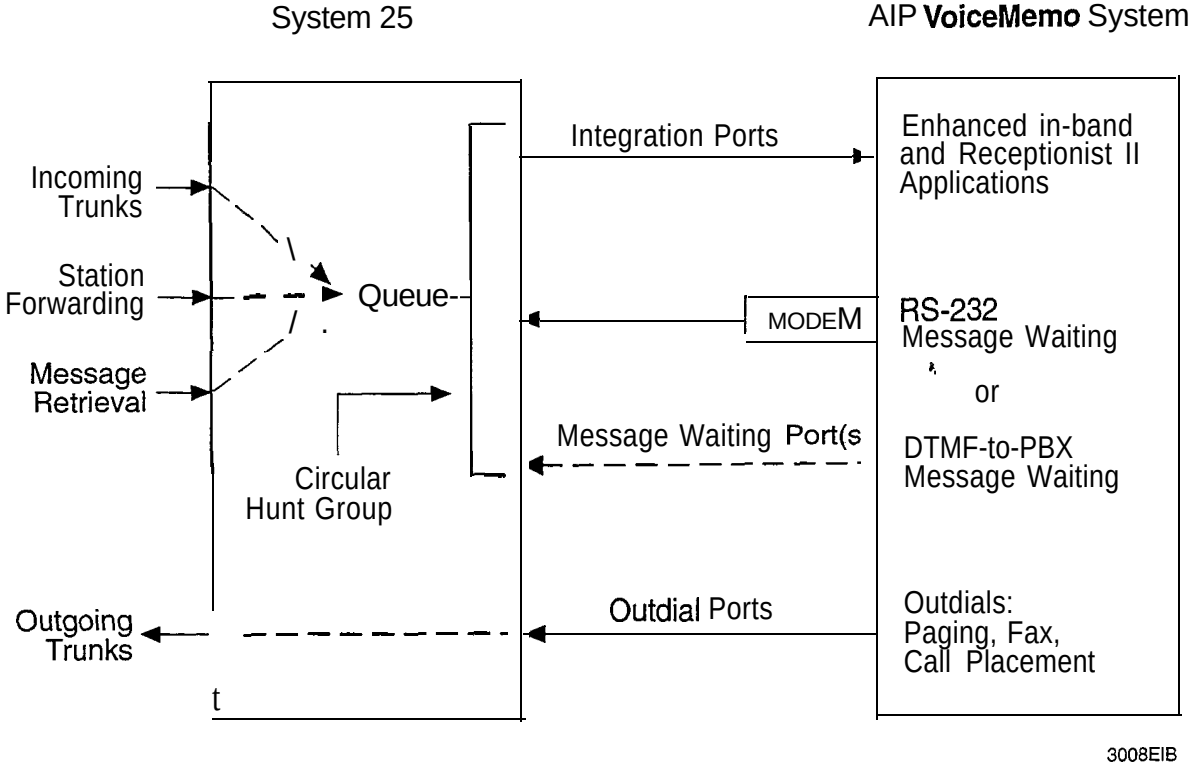


Figure C-l System 25 Integration Structure

Hardware and Software Requirements

The AIP VoiceMemo system software requirements are:

- Release 5.02 or later
- Enhanced In-band Integration optional feature

The AIP system hardware requirements are:

- One line card port for every VoiceMemo/Receptionist II line
- One line card port for DTMF to PBX message wait control, or
- One serial port for RS-232 message wait control
- Additional line card ports to place any outgoing calls (paging, fax, etc.)

The AT&T System 25 software requirements are:

- R2V1 (Release 2, Version 1)
- R3V1 (recommended)

The System 25 hardware requirements are:

- One (1) ZTN-78 port per VoiceMemo/Receptionist II port
- One (1) ZTN-78 port for message wait control

Use of Receptionist II

The System 25 integration allows the optional Receptionist II application to perform supervised transfers. The switch can recognize a switch-hook flash on the line and return dial tone. The Receptionist II port then dials the desired DN and monitors the call. The Receptionist II application can also perform blind (unsupervised) transfers.

See the *Receptionist II* manual for more information about programming for Receptionist II.

VoiceMemo Template Specifications

The default templates for System 25 integration are:

```
NAME: SYS25
DESCRIPTION: AT&T System 25 Application by Centigram

T1: R, T, ,
Next: 2 3 4 5 6
Comment:

T2: # 00# sx##, V1, 50, H
Next:
Comment: direct call

T3: # 01###, V5, 50, H
Next:
Comment: direct Trunk call

T4: # 02# sx# dx#, V2, 50, H
Next:
Comment: Internal Forwarded call

T5: # 03## dx#, V2, 50, H
Next:
```

Comment: External Forwarded call

T6: # 08## dx#, w30 H, 50, H
Next:
Comment: "Port bad" call from the switch

Appendix D:
Norstar Enhanced In-band Integration

This appendix contains supplemental information about integrating an AIP VoiceMemo system with a Northern Telecom Norstar KSU. See the Task List for procedures to configure the integration.

Features and Functions

The Norstar integration operates over a group of digital lines that is equipped with VMI (Voice Mail Interface) modules. The switch routes direct and forwarded calls to the VoiceMemo system over one group of VMI lines. The VoiceMemo system sends message waiting requests to the switch over a separate line (or group of lines) equipped with a VMI or ATA (Analog Terminal Adapter). The Receptionist II application (if installed) operates on the same line group as the VoiceMemo application.

The VMI units convert the Norstar digital telephone interface to standard loop start circuits for the VoiceMemo system. They also serve as translators, passing along the in-band codes needed for the integration and message waiting.

Figure D-l shows the strategy for Norstar to AIP VoiceMemo integration.

The Norstar integration templates are set to expect a prefix digit of 6, and a VMI hunt group pilot extension of 239. Since these are probably not correct for your switch, you must modify the templates during installation.

The KSU does not distinguish between different types of forwarded calls. It sends the same call information message to the VoiceMemo system, regardless of whether the call was forwarded due to a busy, no answer, or forward all condition. This means that mailbox owners cannot use conditional greetings. The switch does send the number of the originally dialed extension for multi-step forwarding, so callers do hear the correct mailbox greeting.

The AIP VoiceMemo system has two types of message waiting notification that you can use with the Norstar:

- DTMF-to-PBX Message Waiting (Type 3) -- uses VoiceMemo line ports to pass DTMF message waiting requests to the KSU.

- Pager and Message Delivery Message Waiting (Type 5) - uses one or more VoiceMemo line ports to outdial to external paging systems or telephone numbers.

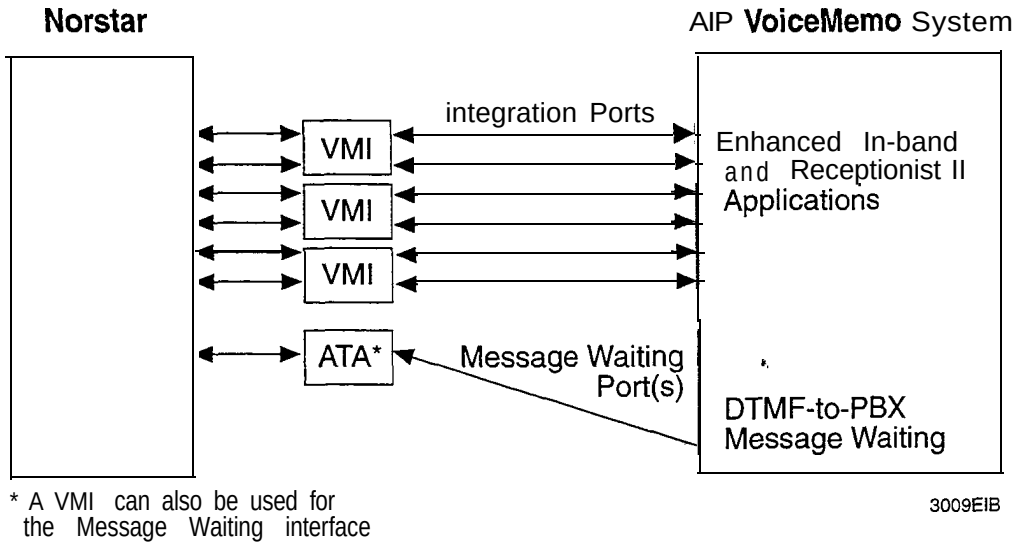


Figure D- 1 **Norstar** Integration Structure

Hardware and Software Requirements

The AIP VoiceMemo system software requirements are:

- Release 5.02 or later
- Enhanced In-band Integration optional feature

The AIP system hardware requirements are:

- One line card port for every incoming phone line
- One line card port for DTMF-to-PBX message wait control
- Additional line card ports to place any outgoing calls (paging, fax, etc.)

The Norstar software requirements are:

- DR2

The Norstar hardware requirements are:

- One (1) two-port VMI unit for each two VoiceMemo/Receptionist ports
- One (1) line through a VMI or ATA for message wait control

Feature Interactions and limitations

The following interactons and limitations may affect the integration of a VoiceMemo system and a Norstar KSU.

- The DR2 does not support Call Forward Busy.
- The Compact DR2 has no Call Forward No Answer.
- The DR3 and DR4 support Call Forward Busy if the station is in use on any line.
- Call Forward Busy is a system-level option.
- Call Forward No Answer means that the ICM rings several times and then the call goes to a VMI.
- A Norstar can support up to ten VMIs.
- The Compact and Modular DR2 only allows blind call transfers from the VoiceMemo sysrem, such as return to operator or to another extension. The DR3 and DR4 both allow supervised transfers through the VMI modules.
- Each VMI connects up to two ports and emulates to ATAs. The emulation behaves like a 7100 phone (one button with flash, conference, and transfer).
- User telephones do not generate DTMF tones during a conference call.

Use of Receptionist II

Only the DR3 and DR4 allow supervised transfers through the VMIs. For a Compact or Modular DR2, the switch recognizes a switch-hook flash on the VMI line, and the Receptionist II port dials the desired DN and goes on hook.

With supervised transfer on a DR3 or DR4 KSU, a Receptionist II port can extend a call to an extension which is No Answer Forwarded back to the VoiceMemo ports. The Receptionist II port waits for that call forward to occur, recognizes by an answer tone that it has connected to a VoiceMemo port, and disconnects.

For this forwarding and call recognition to work correctly, you must:

- Program the VoiceMemo system to recognize the extension numbers of the ports running the Receptionist II application (DP 6034).
- Program the VoiceMemo ports to dial a DTMF # when the system identifies a call forwarded from one of its own ports.
- Set line exception 9 for ringing timeout to be greater than the Norstar's Forward No Answer timer.

See the *Receptionist II Manual* for more information about programming for Receptionist II.

VoiceMemo Template Specifications

The template sets for Norstar integration must be modified to have the correct forward prefix digit and hunt group pilot number. The default templates for Norstar integration are:

```
NAME: NORSTAR
DESCRIPTION: Northern Telecom NORSTAR

T1: R, T, ,
Next: 2 3
Comment: Wait for ring, go off hook

T2: 6 239, V5, 10, V5
Next:
Comment: Direct call that forwards past first VMI port

T3: 6 d3, V2, 10, V5
Next:
Comment: Forwarded call from a station
```

Appendix E:
Worksheet for Enhanced In-band Integration

This appendix contains the worksheet used for configuring the Enhanced In-Band Integration.

Enhanced In-band Integration Worksheet

Enhanced In-band Menu

Application

Application Name _____ (10 chars max.) Application Description _____

MF Enable? ☐ (Offline Menus)

In-band Edit Template Menu

Templates

Template # _____

Data _____ Action _____

Timeout _____ Error Action _____

Next Templates _____

Comment _____

Template # _____

Data _____ Action _____

Timeout _____ Error Action _____

Next Templates _____

Comment _____

Template # _____

Data _____ Action _____

Timeout _____ Error Action _____

Next Templates _____

Comment _____

Template # _____

Data _____ Action _____

Timeout _____ Error Action _____

Next Templates _____

Comment _____

Template # _____

Data _____ Action _____

Timeout _____ Error Action _____

Next Templates _____

Comment _____

Valid Data Field Entries

Data	Description
0-9, * ,#	DTMF/MF digits
A-D	DTMF A through D (column four digits)
<, >	MF digits KP and ST, respectively
R	Ring or seizure
T	Dial tone
H	Hang up
s*n*	Fixed-length source extension containing *n* digits (11 max.)
dn	Fixed-length destination extension containing *n* digits (11 max.)
sx*n*	Variable-length source extension(11 max.) terminated by DTMF/MF character *n*
dx*n*	Variable-length destination extension(11 max.) terminated by DTMF/MF character *n*
X*n*	Ignore *n* digits
Xx *n*	Ignore all digits until the DTMF/MF digit *n*

Valid Action and Error Action Field Entries

Action	Description
Dn	Dial DTMF digits *n*, *(0-9,* A-D) max 23
H	Hang up
T	Go off-hook
W*n*	Wink n/10s of a second
w n	Wait n/10s of a second
v o	Play Login prompt, passcode required
V1	Play Login prompt, passcode optional
v 2	Play Forward All greeting
v3	Play Ring No Answer greeting
v4	Play Busy Forward greeting
V5	Play General greeting (Receptionist II or Message Center greeting)

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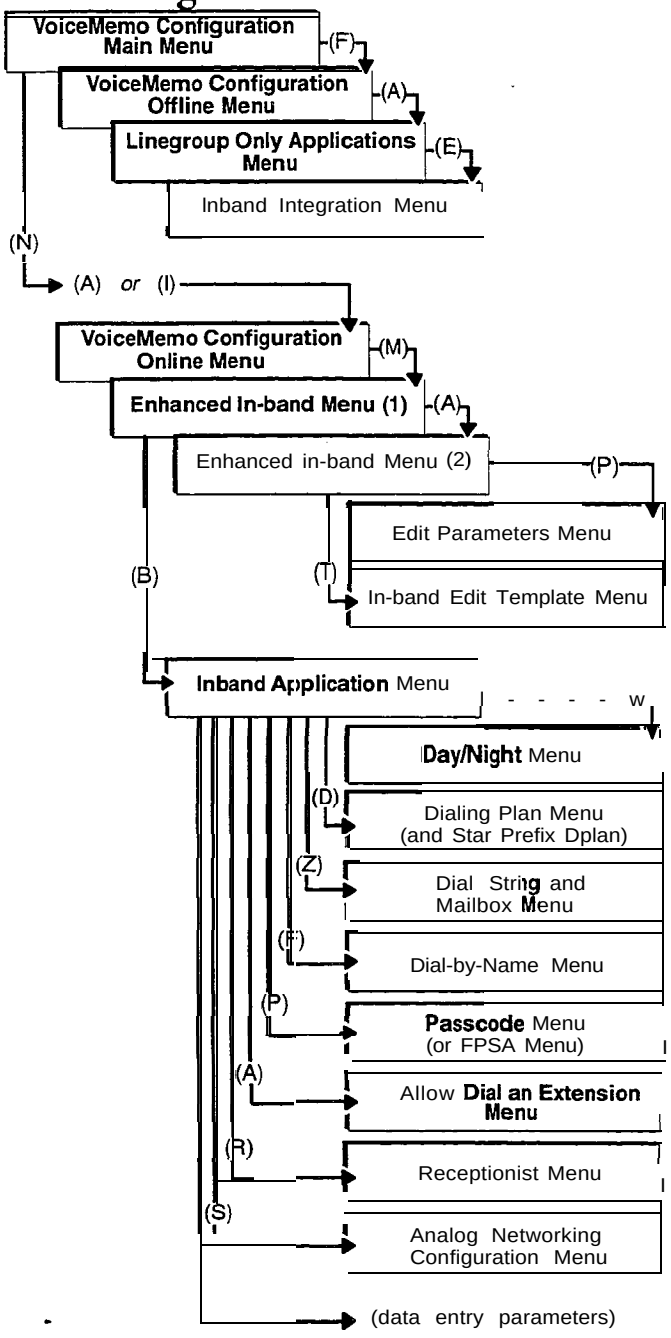
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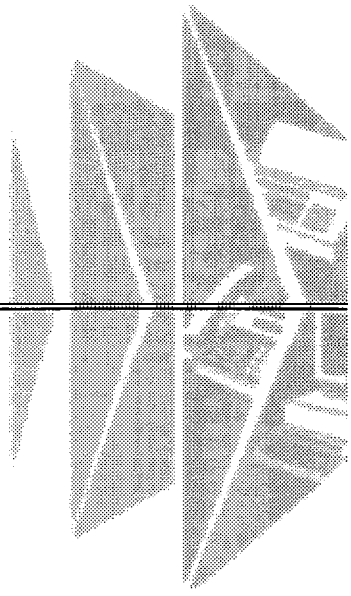


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Voice Processing Solutions 1

E1/T1 Digital Trunk Connectivity Manual



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About This Manual

This manual describes how to configure El or T1 in any of the Centigram Series 6 Communications Servers:

- Model 640
- Model 120
- Model 70

Who Should Read This Manual

This manual is intended for technicians and administrators who are responsible for configuring El or T1 on the Centigram Series 6 server.

How to Use This Manual

This manual contains detailed reference information, a list of tasks that you can perform, a collection of procedures for performing the tasks, and reader aids such as menu maps.

Reference Chapters

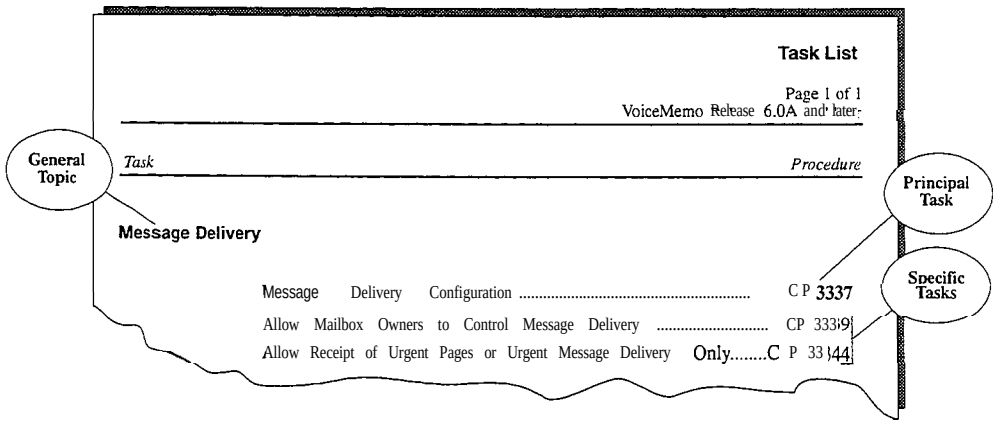


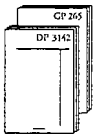
Use the material in Chapters 1 and 2 for detailed inquiry into the configuration of El or T1 in a Centigram Series 6 Communications Server. These chapters discuss how components are related, elaborates on concepts, gives operational details, and contains all necessary tables and figures about configuration. Use the *Centigram Series 6 Installation and Service Manual* appropriate for your platform for an actual server installation and the *VoiceMemo Reference and Configuration Manual* for VoiceMemo software configuration.

Task lists



The task list is located in the Configuration section. Use the task list, starting with a principal task (shown in boldface), to configure El or T1. Each task listed is described in more detail in a procedure. The task list is alphabetized, which helps most readers find the desired task (and procedure) quickly. No particular sequence of tasks is implied. The following example shows how a task list is organized:



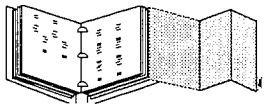


Procedures

Procedures follow the task list in the Configuration section. Follow the steps in Centigram Procedures (CPs) to accomplish the desired tasks. Readers familiar with a Centigram Series 6 server can use the CPs as a checklist if desired, while readers new to a Centigram Series 6 server can use CPs for step-by-step instructions.

A reference column in each CP contains pointers, when necessary, to supplemental information such as another procedure, another manual, a technical reference, or a menu map.

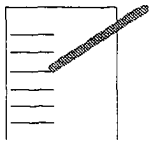
Each Cl' is numbered for document identification and referencing; numbering does not indicate a sequence of performance. A numerical list of all CPs in this manual is also provided. It gives each CP's title, Chapter number, and which other procedures either call it or are called by it.



Menu Maps and Other Navigation Aids

Most of the documents in the new Centigram Series 6 document library have menu maps. You can refer to these document navigation aids at any point to help you reach a menu. And don't overlook the index; it is the fastest way to find all references to a specific topic.

Worksheets



You will find blank worksheets in the back of this manual. Instructions for completing the worksheets are in the Reference chapters. Many of the CPs assume you have completed the appropriate worksheet.

Conventions Used in This Manual

The procedures in this manual use the following conventions to describe how you enter El or T1 configuration information and how information is displayed on the Centigram Series 6 server console:

Press Enter	Press the Enter key. For example, "Press Enter if the current number is correct." On some keyboards, this key is labeled "Return" or has a return arrow (↵) on it.
Enter	Type the text shown, then press the Enter key. For example, "Enter the line number (l-24)" means type a number from 1 through 24, and then press the Enter key.
bold	Words or characters in bold type indicate either a value to be entered by you exactly as shown or, when used to indicate a variable entry, describe the type of value to be supplied by you. See example above.

What you select from a displayed menu

A displayed prompt for information

```
Select: (G) Current Group .
Prompt: Enter a group number =
Response: Number of the line group (l-24) to be used for the application.
```

What you enter in response to the prompt

Note: Unless otherwise stated, press Enter after each response you enter.

Reader Advisories

Reader advisories used in this manual are shown below.

Note: Information especially useful in relation to this procedure.



CAUTION!

Information that helps you prevent equipment or software damage.



CAUTION!

Information that helps you avoid electrostatic discharge (ESD) damage to the equipment.



WARNING!

Information that helps you prevent an interruption to telecommunications traffic.



WARNING!

A hazard that can cause you personal injury.



DANGER!

Warns of a condition that could severely injure or kill you.

Before You Start

This manual assumes that you are familiar with using a console and keyboard. This section describes how to use the Centigram Series 6 server effectively.

Console Tips and Techniques

The tips and techniques offered in the following paragraphs can make configuration entry sessions at the Centigram Series 6 server maintenance console more productive.

Viewing Menus

- When you finish entering a value for a parameter, the server displays an abbreviated form of the current menu, called the "short menu." To view the complete current menu when a short menu is displayed, just press Enter.

- To return to the Main Menu from any VoiceMemo application configuration menu, press X (Exit), until the Main Menu appears.

Accepting Defaults

- To accept a default displayed in a prompt, just press Enter.

- To accept a default displayed in a menu, no action is necessary.

Avoiding Automatic Exit



CAUTION!

The Centigram Series 6 server "times out" after 15 minutes. This means that if you do not enter anything at the console for 15 minutes, the server automatically exits from the current program. When this happens, all work that has not been saved on the disk is lost.

To avoid being timed out and losing your work, follow these steps:

1. When you need time to think, write down the name of the current menu.

2. Exit to the (server) Main Menu.

3. When you want to continue your work, enter the appropriate menu options to regain your place.

If you find that the Centigram Series 6 server has timed out, follow the steps below. If your screen is blank, press any key to reactivate the screen and then continue with these steps.

1. Press any key to start the login sequence.
2. Enter your user ID and password (if requested).
3. Starting from the Main Menu, enter menu options to proceed to the menu from which the server timed out.
4. Reenter data as needed to regain lost work.

Quitting an Entry Session

At any point during entry of offline or online parameters, you can quit. Quitting discards all parameter entries you have made and leaves the VoiceMemo application configuration the way it was before you started entering parameters.

To quit from the VoiceMemo Configuration Offline or Online Menu:

Select: (Q) Quit -- Forget Changes
Prompt: Quit and forget changes? (y/n) =
Response: Y to return to the VoiceMemo Configuration Main Menu.

Shortcut Commands

You can use the **Ctrl** (Control) key or the / (slash) key while simultaneously pressing another key to execute shortcut commands at an Centigram Series 6 server maintenance console.

To do this...	Type...
Activate a timed-out console.	any key
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu and save any entries.	**/X**
From the offline or online menus, or FCOS, LCOS, GCOS menus, return to the VoiceMemo Configuration Menu without saving any entries.	**/Q Y**
Stop scrolling a displayed report.	**Ctrl-S**
Resume scrolling a displayed report.	**Ctrl-Q**
Return to the VoiceMemo application when a # or $ prompt is displayed.	Ctrl-D *or type* exit

1 El Digital Trunk Connectivity

This chapter has a description and brief technical overview of the El digital trunk connectivity available for Centigram Series 6 Communications Server.

El PCM Trunking Overview

The Series 6 Communications Server includes El digital trunk connectivity as a standard feature. This feature facilitates Series 6 server integration with switches which predominantly use digital trunks for connection to the telephone network and to special service equipment such as the Series 6 server.

The Model 70 and Model 1201 both support only one E1 trunk, the Model 120S and the Model 640 each support up to 3 El trunks (up to the maximum 60-port system capacity).

If you need an introduction to the El Digital Trunk Connectivity feature of the Series 6 server for overall applications information, this section is written for you. If you need an introduction to the El Digital Trunk Connectivity Feature as a general review before configuring it or troubleshooting it, this section is also for you.

This section briefly reviews the structure of an El frame and time slot assignment for common channel signaling. It also discusses Series 6 server/El applications, El features, functional operation, alarms, and specifications. This section is not intended to be a comprehensive discussion of digital trunking. For more information on digital encoding of voice signals and digital transmission, refer to the many external resources on the subject. Also, contact Customer Training for the use of digital transmission in Centigram equipment.

Dual El Digital Trunk Multiplexing

The standard El frame (Figure l-l) contains 256 bits divided into 32 time slots of 8 bits each. At 8,000 frames per second, the El bit rate is 2.048 Mbps. Time slot 0 in each frame is used for framing bits and for error-checking bits. Time slots 1 through 15 carry PCM channel circuits 1 through 15, and time slots 17 through 31 carry PCM channel circuits 16 through 30. (The PCM channel circuits carry data- that is, digitized voice signals.) Time slot 16 in the El trunk PCM frame is reserved for line supervision and signaling.

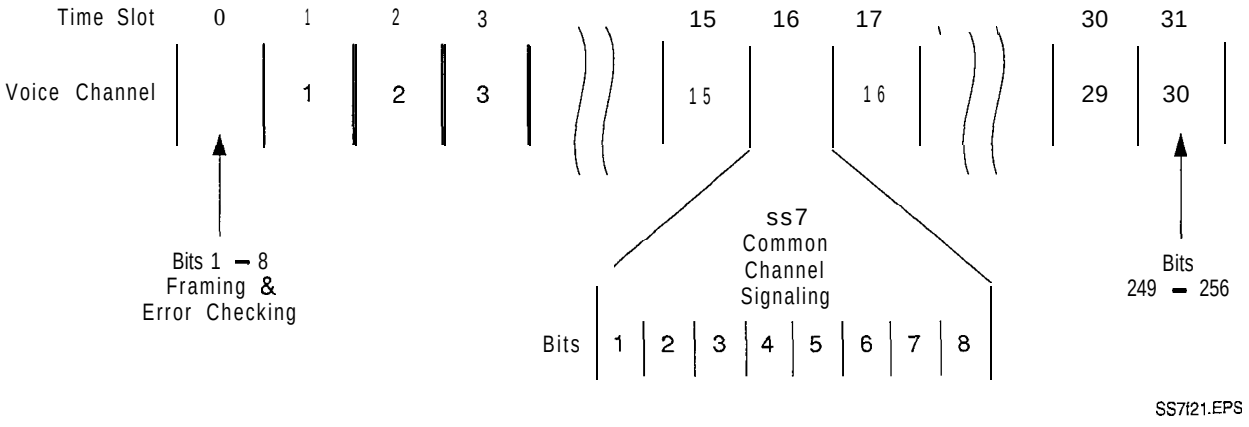


Figure 1-1 E 1 Frame Organization

Common Channel Signaling (CCS)

"Common channel signaling" refers to signaling information for a set of PCM channels. In the case of a digital trunk, CCS carries signaling information for multiple PCM channels in one or more trunks. The signaling data uses time slot 16. Currently, the Series 6 servers use one type of CCS: Signaling System 7 (also known as CCITT C7). Typically, Series 6 servers equipped with El trunks as a standard feature will also be equipped with the SS7 Optional Feature (refer to the SS7 Integration optional feature documentation for your system for further information).

Note: The Series 6 Server supports SS7 as the only CCS optional feature. Channel associated signaling will be available in a future release.

VoiceMemo and E 1 -Applications

Digital trunk connectivity in a Series 6 server is available as a standard feature where the system connects to the local switch through El digital trunks. A Series 6 server module with digital connectivity has one or more Dual El digital trunk interface cards with one or more voice service cards (DSP30 cards, FaxMemo cards, and so forth).

Digital and analog trunks can coexist in the same Series 6 server. Though not typical, such a mix could be implemented in an application where analog trunks exist and a digital trunk is added.

E 1 Connectivity Features

Model 120S and Model 640 Series 6 servers can support a total capacity of 60 PCM voice-application channels per module. Model 70 and Model 1201 Series 6 servers can support a total capacity of 30 PCM voice application channels per module.

Note: "Port" as used elsewhere in Series 6 Communications Server documentation, when used in the context of digital trunk connectivity, equates directly to "PCM channel," "channel," and "circuit."

Model 120S and Model 640 Series 6 server modules can support up to two Dual El Digital Trunk Interface cards with two trunks per card for Series 6 server-to-network connections (for example, for incoming-to-help line connections). Some of the PCM circuits can be allocated for network-to-network connections (for example, for incoming to help line connections).

The user can enable or disable CRC error checking on the trunks and set line coding for the CCITT-standard HDB3 (high density bipolar 3) The system clock can be slaved to the incoming PCM signal or can be set to synchronize with an internal free-running reference.

Tip: To optimize fault tolerance on your system, configure your trunks with the voice application circuits evenly divided between each trunk. Then, for example, in a host with four trunks, a single trunk going out of service results in the loss of only one-fourth of your total available circuits.

E 1 Connectivity Functional Operation

From the standpoint of implementation, the El trunk is expected to be the primary trunk interface to the local switch. Setup through the VoiceMemo Physical Resource Configuration Manager, the Series 6 server expects the Dual El trunk interface card to connect to an SS7 Protocol Conversion Card. The Dual El trunk interface card handles El frame multiplexing and demultiplexing, clock extraction, and so forth. However, because it extracts and interprets the signaling data important to call setup, tear down and routing, the SS7 Signal Processor card must be present before call processing can occur.

On the receive side of the trunk, the Dual El trunk interface card demultiplexes the voice, overhead, and signaling time slots to recover traffic data (voice information), framing and error checking bits, and signaling data. It passes the PCM bearer channels (with voice information) to the DSP 30 Digital Signal Processing line card and signaling data (PCM channel 16) to the SS7 Signal Processing card (Figure l-2).

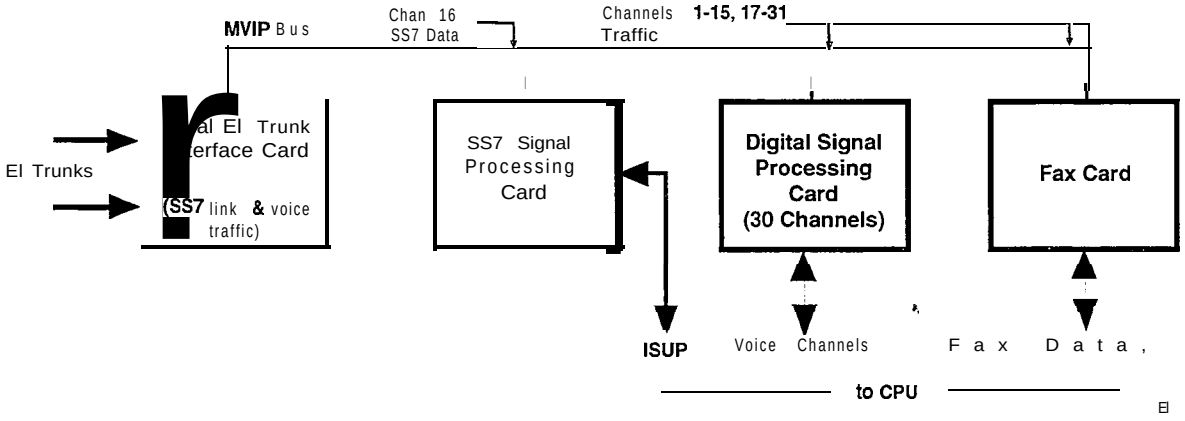


Figure l-2 El Digital Trunk Connectivity Cards

The DSP 30 line card separates the voice data from the PCM frame and hands the data off to the application running in the CPU. Similarly, the SS7 card separates the ISUP information from PCM channel 16 and hands it off to the application running in the CPU.

On the transmit side of the trunk, for outgoing calls (for example, to a help line) the SS7 card assembles the ISUP data from the CPU for the Dual El Trunk Interface card. Similarly, the DSP 30 line card formats the outgoing voice data. For FaxMemo applications, the fax card fulfills the role of the DSP 30 line card but for facsimiles.

Dual El Trunk Interface Card

The Series 6 Server Dual El trunk interface card is the interface for up to two El 2.048 Mbps CEPT digital trunks. The card conforms to CCITT Recommendation G.704 for PCM 30 and to I.431 CCITT Recommendation: for ISDN. The interface card, an AT bus-compatible adapter card, plugs into the Series 6 server backplane in Model 70, Model 120, and Model 640 servers. The Dual El interface card can be ordered to support either balanced (1 00Ω standard 8-pin RJ-48C) or unbalanced (75Ω) trunk connections.

Integration With Analog 'Trunk Interfaces

The El Digital Trunk Connectivity feature may coexist with analog trunks in the same Series 6 server module. In such configurations, the voice channel cards are mix of DSP30 line cards (used in conjunction with the El trunks), and LC8 line cards (used in conjunction with the analog trunks). The Dual El digital trunk interface and the DSP30 line cards interconnect through the MVIP bus. Configuration and line group assignments for both are handled through the Configuration Manager (refer to TR 1903 in the *Technical Reference* for configuration information).

Clock Synchronization

The El clock can be synchronized to either to a clock recovered from the network receive data (RxD) signal of one of the incoming trunks or an internal clock reference (free-running master clock source on the Dual El card). Both El carrier interfaces on the Dual El card recover a 2.048 Mb/sec clock and 8 kHz frame clock from their respective far end carriers. These recovered frame signals go to the on-card clock source for use to control the synchronization of the MVIP clock and frame clock to the El RxD from the network.

An MVIP master clock is the actual source of the clock signals used by all cards common to the MVIP bus. Only one master for each MVIP bus is allowed and only one active 8 kHz frame reference. The El clock default source is the MVIP master on digital trunk interface card number 1, derived from the trunk 0 El RxD signal. (that is, the only digital trunk interface card present in Model 70 and Model 1201 servers). (Trunk numbering is 0 through 3, starting with "0" on the first trunk card.)

Through the configuration manager, the reference source to the master clock is selected offline. Sources include a free-running oscillator on the digital trunk interface card and the network RxD signals (that is, from trunk 0 and trunk 1).

Clock reference switching switchover is "hitless," that is, the clock reference can be manually or automatically switched over to a second source without affecting traffic. For digital trunk connectivity implementations where both trunks terminate in a single Dual El Trunk Interface card, the Series 6 server provides automatic clock source switchover in the event of trunk failure. On detecting a failure of the trunk from which the clock source is derived, the Dual Trunk Interface card automatically switches over to the second digital trunk (if the trunk in operation) on the card.

Because clock references are independent for each Series 6 server module, the Series 6 server can connect to different COs, a CO/PBX combination, or different PBXs. These different connections, however, must go to different Series 6 server modules and must be the primary clock reference within their respective modules.

El Digital Carrier Events

The Dual El digital trunk interface card detects failures on the trunk receive data (RxD). When failures persists for more than 200 milliseconds, the carrier alarm function automatically generates a remote alarm to the far end in accordance with CCITT Recommendations G.732 and G.733. For such failures, the carrier alarm function informs the signaling function that circuits on a failed digital trunk are unavailable and in-process calls are terminated. Only after a trunk is restored for 400 milliseconds are the circuits again made available. The system maintains for these carrier events for each trunk:

- Loss of frame (LOS)
- Frame slips
- Bit errors
- Remote Alarms
- All one's signal (AIS)
- Local carrier alarm
- Remote carrier alarm
- Errored seconds
- Failed seconds

When the server is online, service personnel can monitor several digital trunk conditions and control several functions. These include:

- Displaying event counters, current trunk state, current clock source, and trunk configuration for a single trunk or all trunks in a module.
- Setting the module clock reference.
- Connecting or disconnect a digital loopback toward the facility.
- Placing a digital trunk out-of-service. This action returns an AIS to the switch.
- Restoring a digital trunk to service.

Configuration

Digital trunk connectivity configuration is done offline through the Physical Resource Configuration Manager. Configuration for a Dual El card and for a digital trunk connection consists of the following:

- Selecting the physical slot assignment for the card.
- Setting the module number in which the card is installed.
- Configuring the I/O port address of the card
- Setting the signaling in use by the trunk.
- Setting the sequence number of the trunk.
- Configuring the framing format
- Configuring the coding format for the PCM bit stream.

Procedure CP 3 15 1 lists the steps for configuring a Dual El card.

Slot Assignment

The Dual El Digital Trunk Interface card(s) are assigned (and factory-installed in) specific physical slots in the Series 6 server backplane. The system software requires these slot assignments to identify the hardware resources present in the backplane.

The configuration process for installing the digital trunk interface cards includes the following:

1. Configure the cards (refer to TR 1906 in this volume).
2. In the Physical Configuration Menu, configure the slots assigned to the cards.
3. In the Offline Menus, continue the configuration needed by the applications.

The factory installs the digital trunk interface card in these slots in the Series 6 Model 70, Model 120, and Model 640 servers:

Card Number	Model 70 Slot Number	Model 1201 Slot Number	Model 120S Slot Number	Model 640 Slot Number
0	3	6	6	9
1	—	—	8	11

The Model 70 and Model 120I servers each support only one digital trunk for a maximum system capacity of 30 PCM voice channels. The Model 120S server and Model 640 server each supports up to 120 PCM voice channels (ports) between two digital trunk interface cards.

You assign the slot at the Physical Resource Configuration Menu for the card you are configuring.

Module Number

The module number is the Series 6 server module in which the digital trunk interface card is installed. A four-module Series 6 Model 640 server can support a total capacity of 240 PCM voice channels over 16 trunks. (In such a configuration the line groups would be configured to use only part of the total number of PCM channels available in each trunk. Refer to "El Connectivity Features" on page 3.) You assign the slot for the card you are configuring at the Physical Resource Configuration Menu.

Input/Output Address

The digital trunk interface card can occupy one of two possible AT bus addresses: 0x300h and 0x2300h where address 0x300h is the default address occupied by card 0 and 0x2300h is assigned to Card 1. These addresses can also be assigned to a Smartcard in Model 70 and 1201 servers. Before selecting the I/O address, check the addresses occupied by these cards if they are present in the affected Series 6 server module. If these cards are and either of their addresses are set to the same to which the digital trunk interface card, an address conflict exists and bus contention will occur. Ensure that each card is set to a unique address. The address selected in the Select IO Address Menu must match the address for which the card is physically jumpered.

> **Note:** The digital trunk interface card has jumper positions for setting interrupt request levels. However, the VoiceMemo application polls the hardware to detect status and service the cards and does not use hardware interrupt requests.

You set the card I/O address in the Configuration Menu for Board [DUAL El] in AT slot x.

Signaling

The Series 6 server supports only CCS for CCITT recommendations and ANSI specifications for digital trunk connectivity. And, currently only SS7 (CCITT C7) is supported as the signaling optional feature integration. Refer to the *SS7* Integration Manualfor complete information.

You set El trunk signaling in the Select Trunk Type Menu. The menu has options for both analog and digital trunks. However, when you are configuring a digital trunk interface card, the configuration manager accepts only the digital trunk common channel signaling (CCS) option for El trunks.

Trunk Configuration

Trunk configuration includes the trunk number, framing forma:, and coding format.

Trunk Sequence Number

The trunk number is the logical number of the trunk, beginning with trunk number 0. You set the trunk number at the Configuration menu for T1/E1 Carrier trunk x Menu.

Framing Format

The VoiceMemo application supports CEPT framing and CRC framing. YOU select the framing format the trunk uses at the Configure Frame Format for Board [DUAL El] in AT slot x Trunk y Menu. The configuration manager accepts only the CEPT and CRC framing formats.

Coding Format

The VoiceMemo application supports HDB3 (high density bipolar three) coding formats for El trunks AM1 (alternate mark inversion) and. You select coding for the trunk at the Configure Frame Coding for Board [DUAL El] in AT slot x Trunk y Menu. The configuration manager accepts only CCITT-standard HDB3 or AMI (alternate mark inversion) for El trunks. (AMI, though available as an option, is a less robust line coding technique than HDB3 and is not recommended.)

Clock Synchronization

The system master clock can be synchronized either to the network (that is, a selected El RxD signal) or to a free-running oscillator on the Dual El card. The digital clock reference can be set to one of the following:

- Internal reference
- Network reference
- Default reference

The network reference is a selected El trunk. In the case of a Series 6 Model 70 or Model 1201, the selected trunk will be trunk 0. In the case of Model 120S or Model 640, the selected trunk can be either 0, 1, 2 or 3 (only one trunk can be selected). The default reference is trunk 0.

The Series 6 server features automatic switchover to a backup clock source if the primary fails. However, this feature functions only when both trunks of a Dual El card are used and the clock is synchronized to the RxD signal of one of them.. Then, if the trunk to which the clock reference is derived, the Series 6 server will automatically switch over to the second trunk on the Dual El card.

Note: This clock source switchover feature does not work if digital trunk connectivity is split between two Dual T1 cards.

When configuring the system, use the network clock as the system clock reference to prevent frame slips (Figure l-3). clock as the system clock reference

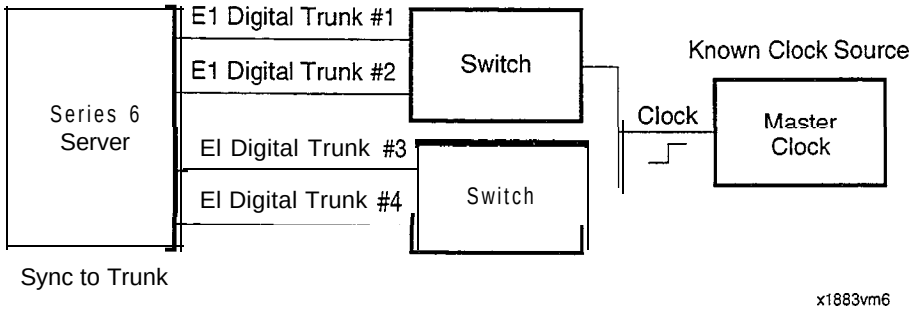


Figure l-3 Digital Trunk Clock Synchronization

Digital Trunk Online Maintenance

The VoiceMemo software features an online maintenance utility for monitoring digital trunk activity and statistics (either individual trunks or all trunks), changing the clock reference, removing trunks from service, and looping back trunks toward the facility. Trunk activity includes the operational state of a trunk, errored seconds, frame slips, and so forth. The display presents trunk status and the configuration of the trunk-a useful feature for quickly validating trunk setup.

The information displayed is dynamic and changes as trunk status changes. For example, if a trunk is taken out of service, the utility immediately reports it to the display. Refer to the Centigram Series 6 *Server Systems Diagnostics Manual* for more information.

2 Dual T1 Digital Trunk Connectivity

This chapter has a description and brief technical overview of the T1 digital trunk connectivity available for Centigram Series 6 servers. It is provided both as an introduction to the digital trunk connectivity feature and to provide planning and installation guidance for retrofitting a Series 6 server with the feature.

T1 PCM Trunking Overview

The Centigram Series 6 Communications Server includes T1 digital trunk connectivity as a standard feature. This feature facilitates serverjntegration with switches which predominantly use digital trunks for connection to the telephone network and to special service equipment such as the Series 6 server. All Series 6 server products can be equipped with digital trunks.

The Model 70 and Model 120I both support only one T1 trunk, the Model 120S and each Model 640 module support up to four T1 trunks, configured to use all trunk channels or fractional T1 (up to the maximum 60-port system capacity).

If you need an introduction to the T1 Digital Trunk Connectivity Feature of the Series 6 server for overall applications information, this section is written for you. If you need an introduction to the T1 Digital Trunk Connectivity Feature as a general review before configuring it or troubleshooting it, this section is also for you.

This section briefly reviews the structure of a T1 frame and the bit assignments for channel associated signaling (CAS). It also discusses Series 6 server/T1 applications, T1 features, functional operation, alarms, and specifications. This section is not intended to be a comprehensive discussion of digital trunking. For more information on digital encoding of voice signals and digital transmission, refer to the many external tutorials on the subject. Also, contact Customer Training for the use of digital transmission by Centigram equipment.

T1 Digital Trunk Multiplexing

When an analog voice signal is digitally encoded, it is periodically sampled to produce an 8-bit representation (a "byte" or "octect") of the sampled moment. This sampling occurs at an 8 kHz rate (which equals 64 kb/s). After digital encoding, each byte is added into a string of bytes encoded from other voice signals for transmission over a common path. This "byte stringing" is done in an orderly manner which repeats the insertion of a series of digitally-encoded voice signals, each assigned to its own time-slot ("channel") to produce frames. This voice data framing is done in stages to assemble ever larger frames, beginning with a *DS1* frame. A DS1

frame has 24 PCM channels with 8 data bits in each time slot (channel) and, including an extra bit as a start-of-frame marker 193 bits makes up a complete frame.

Various framing formats have been developed for channel banks. All formats have a framing bit in every 193rd bit position. A unique bit pattern in the frame bit position repeats every 12 frames to define a complete superframe (Figure 2-l). The composite data rate of a frame is 1.536 Mbps. A framing bit precedes each frame (at the same 8 kb/s rate as the voice channels), increasing the frame rate to 1.544 Mbps.

A D4 superframe has a frame interval of 1.5 milliseconds. VoiceMemo Release 6.0A also supports the extended superframe (ESF) format of 24 frames each. ESF differs from SF by the number of frames it contains (that is, 24), the doubling of framing (F) bits from a 12-bit pattern to 24-bit pattern, and the addition of signaling bits C and D used by channel associated signaling, known as "robbed bit" signaling" (refer to Table 2-l and the following paragraphs). (In networks whtre ESF is not fully implemented, the SF signaling bits are repeated.)

D4 and ESF are two of the formats for digital trunk connectivity feature that VoiceMemo Release 6.0A supports. The standard D4 superframe format is known by domestic RBOCs as the *M24* multiplexer format.

Table 2-I SF and ESF Signaling Bits

Frame	SF	ESF
Frame 6	A	A
Frame 12	B	B
Frame 18	A	C
Frame 24	B	D
Frame 30	A	A
Frame 36	B	B
Frame 42	A	C
Frame 48	B	D

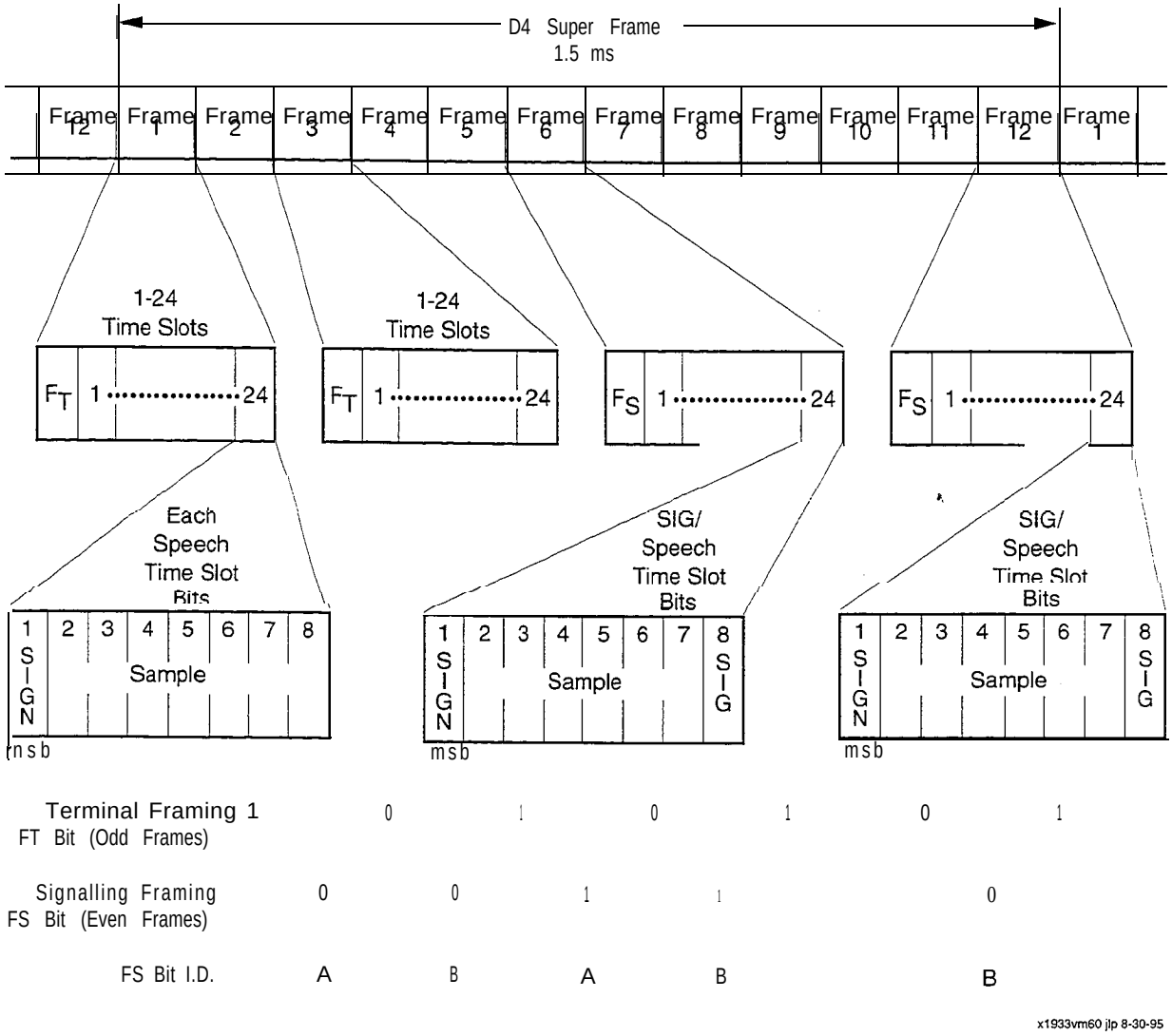


Figure 2-1 **T1** D4 Frame Map

Channel Associated Signaling (CAS)

Release 6.0 digital trunk connectivity for T1 supports only channel-associated signaling for ground start, loop start E & M, and DID trunks. Neither facility data link (sometimes used with ESF) nor remote loopback requests are supported.

Note: VoiceMemo Release 6.0A does not support common channel signaling (CCS) with T1 trunk connectivity. CCS is a method where signaling for all channels is handled using a link that is common to all channels (for example, SS7).

Signaling is channel associated (CAS) where the signaling is handled individually inside each channel. Signaling information is carried in every sixth frame in a SF; the 'A' and 'B' bits alternating every twelfth frame by borrowing ("robbing") the least significant bit from each channel. The "A" and "B" signaling bits each appear in alternating superframes (that is, every twelfth frame). ESF signaling uses four signaling bits, A, B, C, and D. These bits each repeat every twenty-fourth frame. (In networks where ESF is not fully implemented, the C and D bits are not used and the A and B are simply repeated.) Through the use of these two bits, four signaling states can be transmitted (loop start, ground start, E & M, and DID).

Line Coding

When transmitted, digital signals shift between two voltages, typically some negative voltage for one logic condition (-Vdc for "0" for example) and typically some positive voltage for the other logical condition (+Vdc for "1" for example,). This shift, known as a "bipolar shift." where the signal shift does not linger at the zero volts baseline is known as non-return to zero or *NRZ*. Transmission for long distances over wire-based media of bipolar signals has a problem where the transmission cable, which appears as a resonant circuit, integrates the DC voltage (Figure 2-2) of the signal. This is especially true if the voltage remains at positive or negative level for any length of time (as would be the case for a digital signal with a series of "1" or "0" conditions in it). This charging of the transmission cable causes a progressively smaller and smaller differential between logic 0 and 1 voltage conditions. This then results in the inability of a receiving circuit to distinguish between the logic conditions-a distinction that is imperative for recovering the network clock.

To counteract this problem, several coding techniques have been developed to balance plus (+) and minus (–) voltages (that is, prevent long strings of "l's" or "O's"). The Series 6 server digital trunk interface can be configured to use one of three of the more common coding techniques: alternate mark inversion (AMI), AMI with zero code suppression (ZCS), and binary with 8 zeros suppression (BSZS).

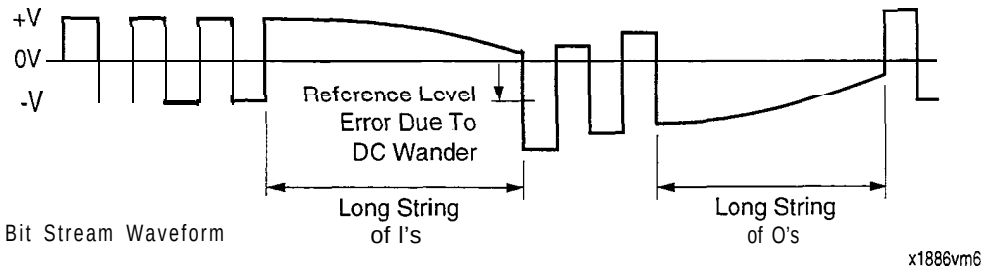


Figure 2-2 DC Voltage Shift in Digital Signal Transmission

AMI

AM1 (alternate mark inversion) is a simple technique which converts a unipolar signal into a bipolar signal. It also inverts the second (and the fourth, sixth, and so forth) of a long string of 1 's (Figure 2-3).

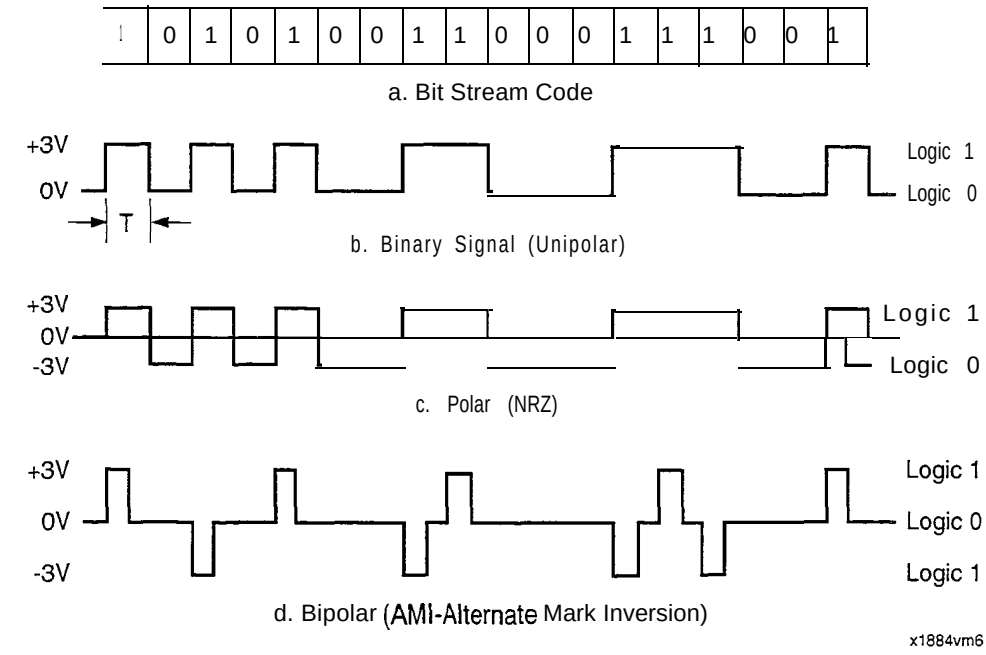


Figure 2-3 **AMI** Line Coding

AMI with ZCS

AMI with zero code suppression is coding technique is similar to basic AMI except that the eighth 0 bit in a string of O's is converted to a 1 bit. This technique interferes with the data when all zeros are transmitted. However, this is not a significant problem when the data represents a voice signal and an occasional reversal of a bit is not apparent in the overall voice signal quality. Of course, AM1 with ZCS *is* a problem when transmitting data that requires a high degree of fidelity (for example, video), but which is not a concern with voice messaging equipment.

B8ZS

B8ZS (bipolar with 8 zeros suppression) introduces a code, recognizable to a data receiver, that a bit has been changed from a 0 to a 1. This technique deliberately introduces a known bipolar violation (BPV) into a data stream. (A bipolar violation occurs where a pulse is of the same polarity as the previous pulse. B8ZS deliberately reverses the fifth and the seventh 0 in a series of eight 0 bits. The receiver recognizes this known bipolar violation and substitutes the proper-data in its place. Because of the predictable nature of B8ZS encoding, this encoding technique does not interfere with the transmitted data. In the example shown in Figure 2-4, AMI is used to code 1's; O's are represented by a return to the baseline (that is, 0 volts).

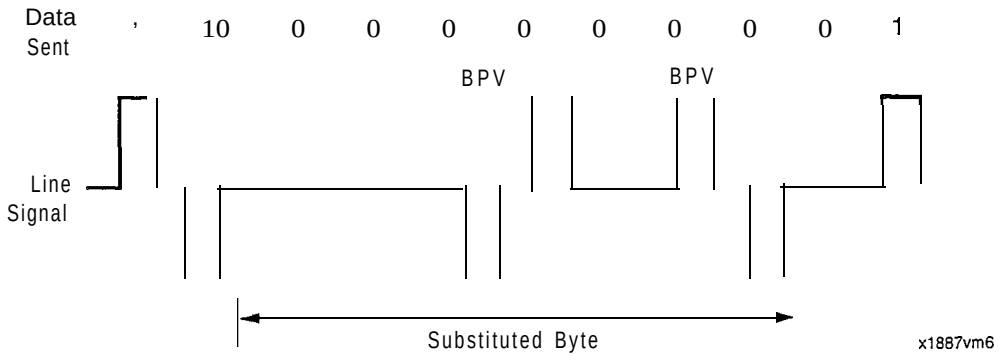


Figure 2-4 **B8ZS** line Coding

The Series 6 Server and **T1—Applications**

Digital trunk connectivity in a Series 6 server is available as a standard feature where the system connects to the local switch through T1 digital trunks. A Series 6 server module with digital connectivity has one or more T1 digital trunk interface cards with one or more voice service cards (DSP24 cards, FaxMemo cards, and so forth).

Digital and analog trunks can coexist in the same Series 6 server. Such a mix could be implemented in a Model 1201 30-port configuration where the maximum number of digital circuits allowed is 24 (that is, one T1 trunk) and the balance of ports are analog trunks.

T1 Connectivity Features

Series 6 servers Model 120S and Model 640 can support a total capacity of 60 PCM voice-application channels per module.

Note: "Port" as used elsewhere in Centigram Series 6 documentation, when used in the context of digital trunk connectivity, equates directly to "PCM channel," "channel," and "circuit."

Series 6 server Model 640 and Model 120S modules can support up to two Dual Tl Digital Trunk Interface cards with two trunks per module for Series 6 server-to-network connections (for example, for incoming-to-help line connections). A Model 1201 and a Model 70 can each support a single trunk. For redundancy, incoming ports can be divided between two trunk interface cards, so long as the total port capacity is not exceeded.

Tip: To optimize fault tolerance on your system, configure your trunks with the voice application circuits evenly divided between each trunk. Thus, in a module with four trunks, a single trunk going out of service results in the loss of only one-fourth of your total available circuits.

For example, for a Model 640 equipped with four digital trunks (that is, two Dual T1 Digital Trunk Interface cards), configure lines groups to use only 15 ports (PCM channels) on each trunk.

The user can set line coding for AM1 (alternate mark inversion), AMI with ZCS (zero code suppression), or B8ZS (binary eighth 0 suppression). The trunk can be disabled using the standard all-ones (AK) signal. By default, the clock is slaved to the incoming PCM signal from the network on trunk 0.

T1 Connectivity Functional Operation

From the standpoint of implementation, the T1 trunk is expected to be the primary trunk interface to the local switch. The T1 Trunk Interface Card handles T1 frame multiplexing and demultiplexing, clock extraction, and so forth. The T1 digital trunk connectivity feature supports from one to four T1 trunks (with up to 60 ports) per module to a single PBX or to a single CO.

On the receive side of the trunk (relative to the Series 6 server, the T1 Trunk Interface Card demultiplexes the voice, overhead, and signaling time slots to recover traffic data (voice information), framing bits, and signaling data.

For connectionsto differing PBXs, COs, or a mix of PBXs and COs with Tls, the trunks should be connected to different modules.

Dual T1 Trunk Interface Card

The Series 6 server uses a Model MB89 110 Dual T1 Trunk Interface Card. This card is the interface for up to two (per card) T1 digital trunks. The interface card, an AT bus-compatible adapter card, plugs into the server backplane in Series 6 Model 70, Model 1201 and Model 120S, and Model 640. The interface card supports balanced (standard 8-pin RJ-48C) trunk connections.

The T1 Digital Trunk Interface and the DSP24 line cards interconnect through the MVIP bus (Figure 2-5). Configuration and line group assignments for both are handled through the Configuration Manager (refer to TR 1903 in the Technical Reference Manual for configuration information).

On the receive side of the trunk, the Dual T1 trunk interface card demultiplexes the voice, overhead, and signaling time slots to recover traffic data (voice information), framing and error checking bits, and signaling data. It passes the PCM bearer channels with voice information and signaling (CAS) data to the Digital Signal Processing line card. The line card connected to the Dual T1 trunk interface card by way of the MVIP bus separates the voice data and CAS information from the PCM data. The line card then forwards them to the VoiceMemo application running on the CPU.

The Digital Signal Processing line card can be DSP24 or a DSP8. A DSP24 has 24 channels available to process the voice signal information from a full T1 trunk. The DSP 8 cards, with 8 channels available to process the voice signal information, are used to support fractional T1 configurations. Refer to TR1901 for DSP8 line card information and to TR1903 for DSP24 line card information in the *Centigram Series 6 Technical Reference Manual.*

On the transmit side of the trunk, for outgoing calls the DSP 24 line card formats the outgoing voice data voice and signaling data from the CPU for the Dual T1 Trunk Interface card.

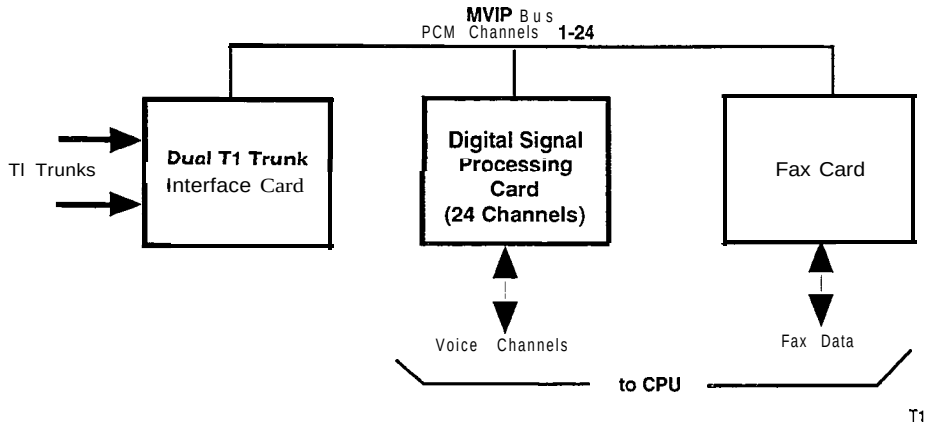


Figure 2-5 T1 Digital Trunk Interface Connectivity

Integration With Analog Trunk Interfaces

The T1 Digital Trunk Connectivity feature can coexist with analog trunks in the same Series 6 server module. In such configurations, the voice channel cards will be a mix of DSP24 or DSP8 line cards used in conjunction with a Dual T1 Trunk Interface card), and LC8 line cards used in conjunction with the analog trunks.

Clock Synchronization

The T1 clock can be synchronized either to a clock recovered from the network RxD signal of one of the incoming trunks or to an internal clock reference (free-running master clock source on the Dual T1 card). Both T1 carrier interfaces on the Dual T1 card recover a 1.544 Mb/sec clock and 8 kHz frame clock from the network T1 received signal (Rx). These recovered frame signals go to the on-card clock source for use to synchronize the MVIP clock and frame clock to the T1 RxD from the network.

An MVIP master clock is the actual source of the clock signals used by all cards common to the MVIP bus. Only one master for each MVIP bus and only one active 8 kHz frame reference are allowed. The T1 clock default source is the MVIP master on digital trunk interface card number 0, derived from the trunk 0 T1 Rx signal (that is, the only digital trunk interface card present in the Model 70 and Model 1201). (Trunk numbering is 0 through 3, starting with "0" on the first trunk card.)

Through the configuration manager, the reference source to the master clock is selected offline. Sources include a free-running oscillator on the digital trunk interface card and the network Rx signals (that is, from trunk 0 and trunk 1). When connected either to a PBX or to a CO, the network clock is always the clock reference.

Clock reference switching switchover is "hitless," that is, the clock reference can be manually or automatically switched over to a second source without affecting traffic. For digital trunk connectivity implementations where both trunks terminate in a single Dual T1 Trunk Interface card, the Series 6 server provides automatic clock source switchover in the event of trunk failure. On detecting a failure of the trunk from which the clock source is derived, the Dual Trunk Interface card automatically switches over to the second digital trunk (if the trunk in operation) on the card.

When connecting to channel banks, the Series 6 server module is the clock reference. In this case, all T1 links to a particular channel bank come from the same Series 6 server module.

Because clock references are independent for each Series 6 server module, the server can connect to different COs, a CO/PBX combination, or different PBXs. These different connections, however, must go to different Series 6 server modules and must be the primary clock reference within their respective modules.

T1 Digital Carrier Events

When the Dual T1 digital trunk interface card detects failures on the trunk receive data (RxD). When failures persists for more than 2.5 seconds, the VoiceMemo carrier alarm function automatically generates a remote alarm to the far end. For such failures, the carrier alarm functionality informs the signaling function that ports on a failed digital trunk are unavailable and terminates in-process calls. Only after a trunk is restored for 10 seconds are the trunk ports again made available to the VoiceMemo application. The server maintains these carrier events for each trunk:

- Loss of frame (LOS)
- Frame slips
- Bit errors
- Remote Alarms
- All one's signal (AIS)
- Local carrier alarm
- Remote carrier alarm
- Errored seconds
- Failed seconds

When the equipment is online, service personnel can monitor several digital trunk conditions and control several functions. These include:

- Displaying event counters, current trunk state, current clock source, and trunk configuration for a single trunk or all trunks in a module.
- Setting the module clock reference.
- Connecting or disconnect a digital loopback toward the facility.
- Placing a digital trunk out-of-service. This action returns an AIS to the switch.
- Restoring a digital trunk to service.

Alarm Handling and Reporting

The T1 digital trunk function in the Series 6 server recognizes and responds to out-of-frame (OOF) alarms, yellow alarms (D4 and ESF) red alarms, and blue alarms. These alarm conditions are all recorded in the system event log. A VoiceMemo maintenance utility presents a Digital Carrier Status screen that shows event counters where trunk error activity can be reviewed.

Out-Of-Frame (OOF) Alarm

When the Dual T1 trunk interface card detects a loss of frame synchronizationit immediately attempts to reframe. A loss of frame is determined to have occurred when the received data framing bits are in error two bits out of four. When the loss of frame occurs, the digital trunk interface driver (the interface control software) tracks the length of time the framing is lost and notifies all affected applications of the OOF condition.

Note: A Blue Alarm (an AIS) from the far end results in an OOF condition.

Yellow Alarm

The Yellow Alarm signal indicates that a DS1 connection has lost frame synchronization. When the Dual T1 Digital Trunk Interface detects an incoming Yellow Alarm, the affected T1 carrier goes into a Carrier Group Alarm state. The Series 6 server module sends the alarm when the OOF condition has been detected for a set minimum time threshold. The form of the yellow Alarm depends on the framing format in use. For D4 framing, a Yellow Alarm consists of setting bit 2 in every channel to zero. An ESF Yellow Alarm consists of the repeating 16-bit pattern: 0000 0000 1111 1111. The Dual T1 digital trunk interface card generates this pattern on the command of the driver software.

These are the timing conventions associated with a Yellow Alarm signal:

1. The Dual T1 digital trunk interface detects an incoming out-of-frame within 335 to 1000 milliseconds.
2. The out-of-frame persists for 2.5 seconds, after which a Yellow Alarm is asserted.
3. The Yellow Alarm is not cleared until the DS1 signal has been reframed for 15±5 seconds.
4. The minimum time interval between the end of one Yellow Alarm and the start of another is 1 second.

Blue Alarm

The Blue Alarm is an alarm indication signal (AIS) and consists of a continuous string of unframed one's (hence the derivative: "all l's" or AIS). This signal is typically used to indicate to the far end that some kind alarm condition exists. This condition could be nothing more than the circuit removed from service for testing or it could mean an equipment failure on the network. The transmission of all ones permits the T1 clock to continue to be recovered from the network Rx signal in the absence of traffic while still communicating the alarm condition.

When the T1 driver is advised of the AIS by the hardware, the affected T1 carrier goes into an OOF condition. The VoiceMemo digital trunk connectivity software treats the condition like any other OOF except for setting the user-accessible status bits and an entry in the system error log that the alarm is a Remote Blue Alarm.

Red Alarm

A Red Alarm is asserted and the affected T1 carrier goes to a Carrier Group Alarm state when the T1 interface detects that an OOF has persisted for more than 2.5±0.5 seconds. A Yellow Alarm is also asserted as long as the T1 remains in a Red Alarm condition.

Carrier Group Alarm (CGA)

The CGA consists of the local node either being in a Red Alarm state or of receiving a Yellow Alarm from the far end. (The Yellow Alarm from the far end indicates that the far end cannot frame on the near end signal.) The CGA is canceled when the Red Alarm condition is removed or when the Remote Yellow Alarm is removed for 100 to 1000 milliseconds.

When then CGA state has been entered, the T1 digital trunk interface software logs an error message in the system error logfile to indicating the CGA. It also sends notice of the CGA to all applications affected by the T-l carrier.

Digital Trunk Status

The VoiceMemo digital trunk status maintenance utility presents a display of summary counters that shows the occurrences of the following events:

- *Errored seconds* where any event with at least one code violation within one second.
- Out *of frame* where two or more framing bit errors out of 16 or fewer consecutive framing "F" bits are detected within a 3-millisecond period.
- Frame *slips* where the digital trunk interface looses frame synchronization. Also where the transmission facility or switch drops or repeats a frame without loosing frame synchronization.
- *Alarm indication* signals (AIS) the transmission facility or switch sends to indicate that a trunk has been put out-of-service from the network end.
- *Errored seconds* where *an errored second* is any second with at least one impairment.
- *Failed second* where an impairment lasted for an entire second.
- *Bit errors* where the count represents the number of bits incorrectly interpreted by the T1 line receiver in the digital trunk interface.
- *Local alarms* is the count of the local alarms that have occurred during the count period.
- *Remote* alarms is the count of the remote alarms that have received during the count period.

Configuration

Digital trunk connectivity configuration is done off-line through the Physical Resource Configuration Manager. After you have planned the system and the

module and physically installed the telephony card, configuration for adding a' Dual T1 card and for a digital trunk connection consists of the following:

- Selecting the physical slot assignment for the card.
- Setting the number of the module in which the card is installed.
- Configuring the I/O port address of the card
- Setting the signaling used by the trunk.
- Setting the sequence number of the trunk.
- Configuring the framing format (D4 or ESF).
- Configuring the coding format for the PCM bit stream (AMI, AMI with ZCS, or BSZS).

Note: Its architecture being based on an AT bus, the server does sense in which slot a card is installed. The VoiceMemo application therefore must be "told" where the cards are in terms of a (logical) slot assignment. Their slot assignments can be any unused slot number (within the range of total possible physical slots). By convention however, these *logical* slot assignments map directly to the *physical* slot into which the cards reside.

In addition to this configuration, the trunk channels are assigned as ports in line groups in the same manner as for a server equipped with analog trunks.

Procedure CP 3150 lists the steps for configuring a Dual T1 digital trunk interface card.

Slot Assignment

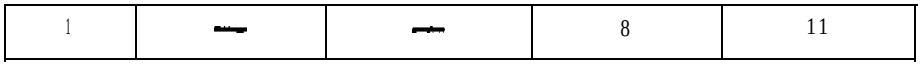
The Dual T1 Digital Trunk Interface card(s) are assigned (and factory-installed in) specific physical slots in the Series 6 server backplane. The system software requires these slot assignments to identify the hardware resources present in the backplane.

The configuration process for installing the digital trunk interface cards includes the following:

1. Configure the cards (refer to TR 1905 in this volume).
2. In the Physical Configuration Menu, configure the slots assigned to the cards.
3. In the Offline Menus, continue the configuration needed by the applications.

The factory installs the digital trunk interface card in these slots in Model 70, Model 120, and Model 640:

Card Number	Model 70 Slot Number	Model 120I Slot Number	Model 120S Slot Number	Model 640 Slot Number
0	3	6	6	9



Model 70 and Model 120I supports only one digital trunk for a maximum system capacity of 24 PCM voice channels. The Model 120S and the Model 640 module each supports up to 60 PCM voice channels between two digital trunk interface cards.

You assign the slot at the Physical Resource Configuration Menu for the card you are configuring.

Module Number

The module number is the Series 6 server module in which the digital trunk interface card is installed. A four-module Series 6 Model 640 server can support a total capacity of 240 PCM voice channels over 16 trunks. (In such a configuration the line groups would be configured to use only part of the total number of PCM channels — that is fractional T1 — available in each trunk. Refer to "T1 Connectivity Features" on page 7.) You assign the slot at the Physical Resource Configuration Menu for the card you are configuring.

Input/Output Address

The digital trunk interface card can occupy one of two possible AT bus addresses: 0x300h and 0x2300h where address 0x300h is the default address occupied by card 0 and 0x2300h is assigned to card 1. These addresses can also be assigned to a Smartcard in Model 70 and 120I servers. Before selecting the I/O address, check the addresses occupied by these cards if they are present in the affected Series 6 server module. If these cards are and either of their addresses are set to the same to which the digital trunk interface card, an address conflict exists and bus contention will occur. Ensure that each card is set to a unique address. The address selected in the Select IO Address Menu must match the address for which the card is physically jumpered.

Note: The digital trunk interface card has jumper positions for setting interrupt request levels. However, the VoiceMemo application polls the hardware to detect status and service the cards and does not use hardware interrupt requests.

You set the card I/O address in the Configuration Menu for Board [DUAL T1] in AT slot x.

Signaling

Each channel in the digital trunk interface can be set for one of these four types of channel associated signaling according to the requirements of CSUs, channel banks, or other related equipment to which the Series 6 server is connected:

- Loop start
- Ground start
- Direct Inward Dial (DID)
- E & M

You set the trunk signaling in the Select Trunk Type Menu. The menu has options for both analog and digital trunks. However, when you are configuring a digital trunk interface card, the configuration manager accepts only the digital trunk options.

Trunk Configuration

Trunk configuration includes the trunk number, framing format, and coding format.

Trunk Sequence Number

The trunk number is the logical number of the trunk, beginning with trunk number 0 on trunk card 1. You set the trunk number at the Configuration menu for T1/E1 Carrier at trunk x Menu.

Framing Format

The Series 6 server supports D4 12-channel frames and extended superframe (ESF) 24 channel frames. You select the framing format the trunk uses at the Configure Frame Format for Board [DUAL T1] in AT slot x Trunk y Menu.

Coding Format

The Series 6 server supports B8ZS, AMI (alternate mark inversion) and AMI with ZCS (zero code suppression) coding formats for T1 trunks. You select coding for the trunk at the Configure Frame Coding for Board [DUAL T1] in AT slot x Trunk y Menu.

Clock Synchronization

The system master clock must be synchronized to the network (that is, a selected T1 RxD signal). The digital clock reference can be set to one of the following:

- Network
- Default
- Internal (reserved for connections to channel banks)

The network clock referenceis the RxD signal of a selected T1 trunk. In the case of Model 70 and Model 1201, the selected trunk is trunk 0. For Model 120S, selected trunk can be 0 or 1. For Model 640, the selected trunk can be 0, 1, 2, or 3 (only one trunk can be selected). The default reference is trunk 0.

The Series 6 server features automatic switchover to a backup clock source if the primary fails. However, this feature functions only when both trunks of a Dual T1 card are used and the clock is synchronized to the RxD signal of one of them..

Then, if the trunk to which the clock reference is derived, the Series 6 server will automatically switch over to the second trunk on the Dual T1 card.

Note: This clock source switchover feature does not work if digital trunk connectivity is split between two Dual T1 cards.

When configuring the system, use the network clock as the system clock reference to prevent frame slips (Figure 2-6). However, use the internal clock reference when the trunks are connected to channel banks.

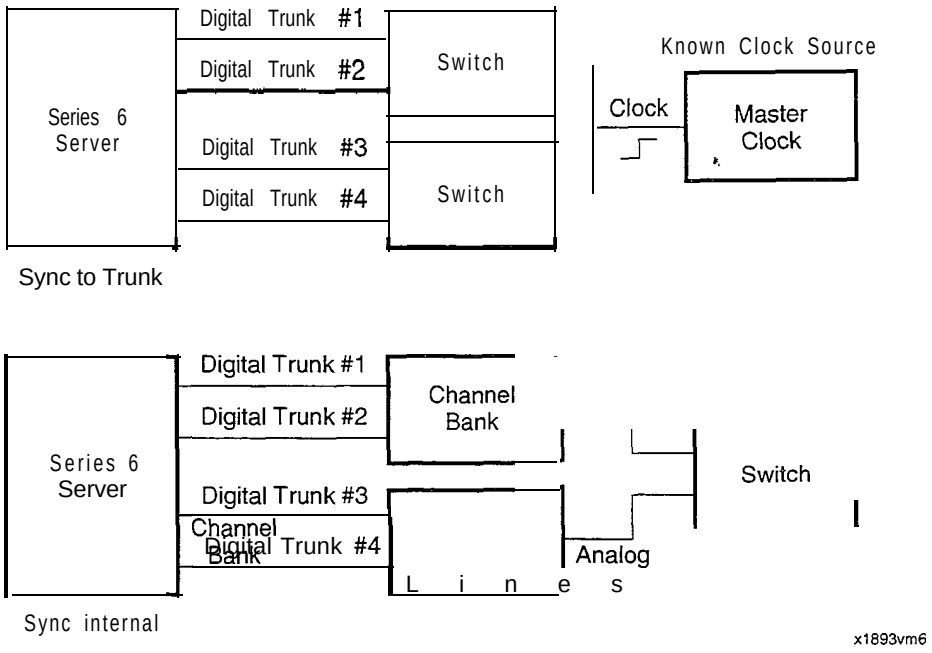


Figure 2-6 Digital Trunk Clock Synchronization

Digital Trunk Online Maintenance

The VoiceMemo application has an online maintenance utility for monitoring digital trunk activity and statistics (either individual trunks or all trunks), changing the clock reference, removing trunks from service, and looping back trunks toward the facility. Trunk activity includes the operational state of a trunk, errored seconds, frame slips, and so forth. The display presents trunk status and the configuration of the trunk-a useful feature for quickly validating trunk setup.

The information displayed is dynamic and changes as trunk status changes. For example, if a trunk is taken out of service, this utility immediately reports it to the display. Refer to the *Centigram Series 6 Diagnostics Manual* for further information.

Configuration Task list

VoiceMemo Release 6.0A and later

Task	*Procedure*

E 1 /T1 Configuration

Change the Digital Trunk Connectivity Clock Reference	CP 3 152
Dual El Offline Configuration	cl? 3151
Dual T 1 Offline Configuration	CP 3150
Monitor Digital Trunk Statistics	CP 3153
Place a Digital Trunk Into Service	CP 3155
Put Digital Trunk Out of Service	CP 3154

Dual T1 Offline Configuration

VoiceMemo Release 6.0A and later

Though typically a factory-installed standard feature, the Dual T1 digital trunk connectivity feature can be retrofitted to a Series 6 server in the field. Use this procedure if you are adding a Dual T1 Digital Trunk Interface card to a Series 6 server that you already have. This procedure presumes that you have already set the card jumpers and switches and installed it in the Series 6 server.

This procedure gives you the instructions for configuring the feature software to support a T1 digital trunk. T1 trunk configuration is done offline using the Resource Manager. In this procedure you will set:

- Module number in which the Dual T1 card resides
- I/O port address of the card
- Signaling used on the trunk channels
- Trunk number (0 through 60), framing format (D3/D4 or ESF), and coding (AM1 or AM1 with ZCS)

Step *Reference*

1. Reach the offline Resource Configuration Menu. Menu Map 13

2. Add a resource card number.

   Select: (A) Add resource card
   Prompt: Available slots are: x x x 9 x 11 x x x
   Input your choice:
   Response: The card number according to the Model of the Series 6 server (refer to the following Series 6 server matrix for Model 640 and Model 120S). For Model 1201, type 6. For Model 70, type 3.

Model 640 (60 ports/module maximum)

Slot No.	Config. No. 1	Config. No. 2	Config. No. 3	Config. No. 4
8			DSP8-7*	
9	Dual Tl-0	Dual Tl-0	Dual Tl-0	Dual Tl-0
10	DSP24-0	DSP24-0	DSP8-1	DSP8-1
11	Dual Tl-1	DSP24-1	DSP8-2	DSP8-2
12	DSP24-1		DSP8-3	DSP8-3
13			Dual Tl-1	DSP8-4
14			DSP24/DSP8-5*	DSP8-5
15			DSP8-6*	DSP8-6

Model 120S (60 port maximum)

Slot No.	Config. No. 1	Config. No. 2	Config. No. 3	Config. No. 4
4			DSP8-7*	
5			DSP8-6*	DSP8-6*
6	Dual Tl-0	Dual Tl-0	Dual T1-0	Dual Tl-0

Model 120S (60 port maximum)

7	DSP24-0	DSP24-0	DSP8-1	DSP8-1
8	Dual T1-1	DSP24-1	DSP8-2	DSP8-2
9	DSP24-1		DSP8-3	DSP8-3
10			Dual Tl	DSP24-1/DSP8-4*
11			DSP24-1/DSP8-5*	DSP8-5*

Step	*Reference*

*DSP8 modules installed only if DSP24-1 not present. Cards can e a mix of DSP8/24s and LC8s so long as total ports per module does not exceed 60. Only count number of T1 channels enabled (Fractional T1). Fax ports are not included n the total port count. The confirmation message Board [DUAL T1] is added to slot x, where "x" istheslot number you added in Step 1 above.

3. At the Add Board to Database Menu, add the digital trunk interface card. Exit back to the Resource Configuration Menu when done.

   Select: (A) DUAL T1
   Prompt: Input your choice, ? for help
   (A/B/C/D/E/F/X/?):
   Response: The card number according to the Model of the Series 6 server (refer to the matrix above for Series 6 for Model 640 and Model 120S). For Model 1201, type 6. For Model 70, type 3.

4. At the Resource Configuration Menu, identify the logical number of the module. For Model 640, this number can be either 1, 2, 3, or 4. For Model 120 and Model 70, this number is 1.

   Select: (M) set Module number
   Prompt: Input Module #:
   Response: 1, 2, 3, or 4.

5. At the Resource Configuration Menu, configure the Dual T1 Digital Trunk Interface card.

   Select: (C) Configure resource card
   Prompt: Occupied slots are:
   Slot Card
   ---- ----
   xx DUAL T1
   Input your choice:
   Response: The card number according to the Model of the Series 6 server (refer to the Series 6 server matrix that follows Step 2 for Model 640 and Model 120S). For Model 1201, type 6. For Model 70, type 3.

6. From the Configuration Menu for Board [DUAL T1] in AT slot x (where x is the slot number entered in Step 5), reach Change IO Port Address Menu to configure the IO port address for the card. — Menu Map 13

7. At the Select IO Port Address Menu, select the input/output address for which the card is physically configured. The addresses are 0x300h (the default address for card 0) and 0x2300h for card 1. Exit back to the Configuration Menu for Board [DUAL T1] in AT slot x Menu when you are done. — TR 2005

8. From the Configuration Menu for Board [DUAL T1] in AT slot x (where x is the slot number entered in Step 4), reach the Configuration Menu for T1/E1 Carrier at trunk 0 to configure the digital trunk. — Menu Map 13

Step	*Reference*

9. At the Configuration Menu for T1 /El Carrier at trunk 0, set the logical number of the trunk. Trunk configuration consists of setting the trunk number, framing, and coding.

   Select: (T) set Trunk number
   Prompt: Input your choice, ? for help (T/F/C/D/?):
   Response: 0 or 1

10. From the Configuration Menu for T1/E1 Carrier at trunk 0, reach the Configure Frame Format for Board [DUAL T1] in AT slot x Trunk 0 Menu. — Menu Map 13

11. At the Configure Frame Format for [DUAL T1] in AT slot x Trunk y (where "y" is the trunk number you entered in Step 9), select the framing format you want for the trunk. You can frame the trunk as either a D3/D4 trunk (with PCM 12-channels) or as an ESF trunk (24 PCM channels). The CEPT and CRC framing options are not available for T1 trunks.

    Because you have not yet set the trunk coding format, the default AM1 (alternate mark inversion) coding appears in the confirmation. Also, because CAS is the only signaling type available for Series 6 T1 trunk connectivity, CAS appears in the confirmation message as the selected signaling type.

12. Exit to the Configuration Menu for T1/E1 Carrier at trunk 0 when you are done.

13. From the Configure Menu for T1/E1 Carrier at trunk 0, reach the Configure Frame Coding for Board [DUAL T1] in AT slot x Trunk y Menu.

14. At the Configure Frame Coding for Board [DUAL T1] in AT slot x Trunk y Menu, select the trunk coding format you want. The coding type can be either AM1 or AM1 with ZCS (zero code suppression).

15. From the Configuration Menu for Board [DUAL T1] in AT slot x (where x is the slot number entered in Step 4), select the PCM channels you want to configure for a type of signaling.

    Select PCM channels as a range (for example, O-4) or as a series (for example, 2,4,6,9,15,16,24). C hannel numbers begin at 00 and end at 47 where PCM channels 00 through 23 are carried by trunk 0 and PCM channels 24 through 47 are carried by trunk 1.

    Select: (T) set Trunk signaling type
    Prompt: Input a range channels (O-4 or 1,4,7, and so forth):
    Response: The numbers of the PCM channels whose signaling you want to configure.

    Pressing Enter takes you to the Select Trunk Type Menu.

Step	*Reference*
16. At the Select Trunk Type Menu, select the signaling associated with the PCM channels you selected in Step 15. You can select only the options for digital trunks. If you select signaling for analog signaling, you get the error message "Can not set Analog trunk type to Digital Trunk." Select: (4) Digital-E&M, (5) Digital-Loopstart, (6) Digital-DID, or (7) Digital-Groundstart *Prompt:* `Input your choice, ? for help (0/1/2/3/4/5/6/7/8/X/?):` *Response:* 4, 5, 6, or 7, as appropriate. After you select the signaling type, you get this confirmation message: The following confirmation message: `The following channels are set to: Digital_xxxx` `Trunk: y` `Channels: a,b,c,d` where "xxxx" is the signaling type you selected in Step 8 above, "y" is the number of the trunk (0 or I), and "a,b,c,d" are the numbers of the PCM channels you selected in Step 15 above. LS = loop start, GS = ground start, DID = direct inward dial, and E&M = E&M.	Menu Map 13
17. Repeat Steps 15 and 16 until you have selected the trunk signaling the for each of the available PCM channels associated with the Dual T1 digital trunk interface card that you are configuring.	
18. Exit back to the Configuration Menu for Board [DUAL T1] in AT slot x when you are done.	
19. At the Configuration Menu for Board [DUAL T1] in AT slot x, display the current trunk configuration to review the signaling that you have configured for each PCM channel. Figure 1 shows a typical trunk configuration list. To correct any signaling configuration errors, repeat Steps 15 and 16 as required.	
20 Exit back to the Resource Configuration Menu when you are satisfied with your trunk signaling configuration.	

Step *Reference*

```
Card: DUAL T1
IO Port Address: OX300
Resources: (48) Net-Dat; (48) Net-Sig;
                          ----------
T1/E1 Carrier configuration:
Trunk: 0                  Configuration: D3/D4, B8ZS, CAS
Trunk: 1                  Configuration: D3/D4, AMI ZCS, CAS
                         ----------
Trunk Type for each channel:
Chnl: 00  01  02  03  04  05  06  07  08  09  10  11
Type:E&M E&M E&M E&M  E&M LS  LS  LS  LS  LS  LS  LS

Chnl: 12  13  14  15  16  17  18  19  20  21  22  23
Type: LS  LS  LS  LS  LS  LS  LS  LS  LS  LS  LS  LS

Chnl: 24  25  26  27  28  29  30  31  32  33  34  35
Type: LS  LS  LS  LS  LS  LS  LS  LS  LS  LS  LS  LS

Chnl: 36  37  38  39  40  41  42  43  44  45  46  47
Type: LS  LS  LS  LS  LS  LS  LS  LS  LS  LS  LS  LS
```

Figure 1 Typical Trunk Configuration List

2 1. From the Resource Configuration Menu, reach the Digital Clock Reference Configuration Menu. — Menu Map 13

22. From the Digital Clock Reference Configuration Menu, select the clock reference for the digital trunks. Your options include a reference derived from the network RxD signal, and the default clock reference (trunk 0).

    Note: the internal clock reference is provided for those applications where the server is connected to channel banks and no network clock reference is available.

23. Exit back to the VoiceMemo Configuration – Main Menu when you are done.

24. If you have completed your digital trunk connectivity feature configuration, activate the configuration. If you have not completed configuring digital trunk connectivity, go to the appropriate procedure.

Dual El Offline Configuration

VoiceMemo Release 6.0A and later

Though typically a factory-installed standard feature, the El digital trunk connectivity feature may be retrofitted to a system in the field. Use this procedure if you are adding a Dual El Digital Trunk Interface card to a Series 6 server that you already have.

This procedure gives you the instructions for configuring the feature software to support a El digital trunk. El trunk configuration is done offline using the Resource Manager. In this procedure you set the:

- Module number in which the El card resides.
- I/O port address of the card.
- Trunk number (0 and 1), framing format (CEPT4 or CRC), and coding (HDB3 or AMI).

Note: Though you find digital signaling options for E & M, loop starts DID, and ground start trunks, the VoiceMemo application allows only CCS (that is, SS7) for El trunk connectivity. Please refer to the *SS7* Integration *Manual* for more information.

Step	*Reference*
1. Reach the offline Resource Configuration Menu	Menu Map 13

2. Add a resource card.

   Select: (A) Add resource card
   Prompt: `Available slots are: x x x 9 x 11 x x x`
   `Input your choice:`
   Response: The card number according to the Model of the Series 6 server. Model 640 server cards occupy slots 9 and 11. Model 120S server cards occupy slots 6 and 8. Model 1201 server cards occupy slot 6. Model 70 server cards occupy slot type 3.

3. At the Add Board to Database Menu, add the digital trunk interface card.

   Select: (B) DUAL El
   Prompt: `Input your choice, ? for help`
   `(A/B/C/D/E/F/X/?):`
   Response: The card number according to the Model of the Series 6 server. Model 640 server cards occupy slots 9 and 11. Model 120S server cards occupy slots 6 and 8. Model 1201 server cards occupy slot 6. Model 70 server cards occupy slot type 3.

The confirmation message `Board [DUAL El] is added to slot x,` where "x" is the slot number you added in step 1 above.

Step	*Reference*
4. Exit back to the Resource Configuration Menu when done.	
5. At the Resource Configuration Menu, identify the logical number of the module. This number is either 1, 2, 3 or 4. Select: (M) set Module number *Prompt:* Input Module #: *Response:* 1, 2, 3, or 4.	
6. At the Resource Configuration Menu, configure the Dual El Digital Trunk Interface card. Select: (C) Card Configuration *Prompt:* Occupied slots are: Slot Card ==== ==== xx DUAL El Input your choice: *Response:* The card number according to the Model of the Series 6 server. Model 640 server cards occupy slots 9 and 11. Model 120S server cards occupy slots 6 and 8. Model 1201 server cards occupy slot 6. Model 70 server cards occupy slot type 3.	
7. From the Configuration Menu for Board [DUAL El] in AT slot x (where x is the slot number entered in step 6), reach Change IO Port Address Menu to configure the IO port address for the card.	Menu Map 13
8. At the Change IO Port Address Menu, select the input/output address for which the card is configured. The possible allowable addresses are 0x300h (the default address for card 0) and 0x2300h for card 1.	TR 2005
9. Exit to the Configuration Menu for Board [DUAL El] in AT slot x Menu when you are done.	Menu Map 13
10. From the Configuration Menu for Board [DUAL El] in AT slot x (where x is the slot number entered in step 4), reach the Configuration Menu for El/El Carrier at trunk 0 to configure the digital trunk.	
11. At the Configuration Menu for El/El Carrier at trunk 0, set the logical number of the trunk. Trunk configuration consists of setting the trunk number, framing, and coding. Select: (T) set Trunk number *Prompt:* Input your choice, ? for help (T/F/C/D/?): *Response:* 0 or 1	Menu Map 13
12. From the Configuration Menu for E1/E1 Carrier at trunk 0, reach the Configure Frame Format for Board [DUAL El] in AT slot x Trunk 0 Menu.	Menu Map

Step	*Reference*
13. At the Configure Frame Format for [DUAL El] in AT slot x Trunk y (where "y" is the trunk number you entered in step 1 I), select the framing format you want for the trunk. You can set the trunk for CEPT framing or for CRC framing. Because you have not yet set the trunk coding format, the default HDB3 coding appears in the confirmation. Also, because CCS is the only signaling type available for El trunk connectivity, CCS appears in the confirmation as the selected signaling type.	Menu Map 13
14. Exit back to the Configuration Menu for El /El Carrier at trunk 0 when you are done.	Menu Map 13
15. From the Configuration Menu for El/El Carrier at trunk 0, reach the Configure Frame Coding for Board [DUAL El] in AT slot x Trunk y Menu.	
16. At the Configure Frame Coding for Board [DUAL El] in AT slot x Trunk y Menu, select the trunk coding format you want. The coding type can be either HDB3 (recommended) or AMI.	vlenu Map 13
17. From the Configuration Menu for Board [DUAL El] in AT slot x (where x is the slot number entered in step 4), reach the Select Trunk Type Menu.	vlenu Map 13
18. At the Select Trunk Type Menu, set the type of signaling for 'Common Channel Signaling."	vlenu Map 13
19. When you are done, exit to the Configuration Menu for Board [DUAL El] in AT slot x. Note: To be operational, the El Digital Trunk Connectivity feature requires the installation of the SS7 Integration. You can only select the CCS option for digital trunks. If you select any other option, you see the error message "Can not set xxxx trunk type to Digital Trunk." *Select:* (4) Common Channel Signaling *Prompt:* Input your choice, ? for help (0/1/2/3/4/5/6/7/8/X/?): *Response:* *4* After you select the signaling type, the configuration display shown in Figure 1.	vlenu Map 13
20. At the Configuration Menu for Board [DUAL El] in AT slot x, display the current trunk configuration to review the signaling that you have configured for each PCM channel. Figure 1 shows a typical trunk configuration list.	Menu Map 13
2 I. Exit back to the Resource Configuration Menu when you are satisfied with your trunk signaling configuration.	

Step	*Reference*

```
E1/E1 Carrier configuration:
Trunk: 0                  Configuration: CEPT CRC, HDB3, CCS
Trunk: 1                  Configuration: CEPT CRC, HDB3, CCS
                           ----------
Trunk Type for each channel:
Chnl:  00  01  02  03  04  05  06  07  08  09  10  11  12  13  14
Type: CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS

Chnl:  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29
Type: CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS

Chnl:  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44
Type: CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS

Chnl:  45  46  47  48  49  50  51  52  53  54  55  56  57  58  59
Type: CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS CCS
```

Figure 1 Typical Trunk Configuration list

22. From the Resource Configuration Menu, reach the Digital Clock Reference Configuration Menu. — Menu Map 13

23. From the Digital Clock Reference Configuration Menu, select the clock reference for the digital trunks. Your options include a reference derived from the network RxD signal, and the default clock reference (trunk 0). — Menu Map 13

24. Exit when you are done.

25. If you have completed your digital trunk connectivity feature configuration, activate the configuration. If you have not completed configuring digital trunk connectivity, go to the appropriate procedure.

Change the Digital Trunk Connectivity Clock Reference

VoiceMemo Release 6.0A and later

In addition to the clock reference selection in the offline digital trunk configuration, the clock reference can be changed through the Digital Connectivity Maintenance Menu.

Step	*Reference*
1. Reach the Digital Connectivity Status/Maintenance Menu.	Menu Map 13

2. Change the module clock reference.

   Select: (C) Change module clock reference
   Prompt: Module Holding digital board(s):
   Response: The number of the module in which the affected digital trunk interface card is installed.

   Prompt: Module clock reference: (I,0-3)
   Response: I for internal or the number 0, 1, 2, or 3 which corresponds to the trunk to which you want the clock reference derived.

3. Monitor all trunks to verify that the clock reference has changed to the reference you selected in step 2.

   Select: (A) Monitor all trunks
   Prompt: Module holding digital board(s):
   Response: The number of the module.

   The system presents the following statistics display:

```
DIGITAL CARRIER STATUS DISPLAY: Tue Aug 1 12:28:03 1995

TRUNK NO:0   CUR STATE:IN-SYNC CONFIG:CEPT, HDB3, CCS CLK REF: TRUNK0

Error Counters - Error Sec.: 0000     OOF:     0004 Slip:     0000 AIS:     0000
11:10:23 08/01/95 Fail Sec.: 0000     Bit Err:0000 Lcl. Alm:0000 Rem
    Alm:0000
```

4. Check the CLK REF to ensure that it is the clock reference you chose. If it is not, repeat Step 2 to reselect the clock reference. If the trunk reference does not change, refer to the *Centigram* Series *6 Diagnostics* Manual for troubleshooting information.

5. After you have selected the system clock reference you want, exit to the Main Menu.

Monitor Digital Trunk Statistics

VoiceMemo Release 6.0A and later

The ability to monitor digital trunks gives statistical data on trunk operation as it affects voice messaging. This data is valuable for network management and for Series 6 server maintenance.

The trunk monitor display gives performance statistics totals for the period current the most recent second as indicated by the time and date stamp on the display. The display is dynamic, updated every second by the server. As required for your data collection task, you can reset the counters before you begin monitoring trunk statistics. This feature can be useful for verifying trunk operation after reconfiguring a trunk or replacing a digital trunk interface card.

The trunk information presented and the statistics collected include:

- Current state of the trunk (in-sync, out-of-sync, and so forth)
- Trunk configuration (framing, line code, and signaling)
- Source of the system clock reference
- Errored seconds (ES)
- Out-of-frame conditions (OOF)
- Frame slips
- AIS
- Failed seconds (FS)
- Bit errors
- Local alarm totals
- Remote alarm totals

Step	Reference
1. Reach the Digital Connectivity Status/Maintenance Menu.	Menu Map 13
2. Monitor a selected digital trunk. Select: (B) Monitor a single trunk *Prompt:* Host holding digital board(s) : *Response:* The number of the module. *Prompt:* Reset counters (Y/N): *Response:* As required, Y *Prompt:* Trunk number: *Response:* The number of the trunk of interest.	

The system presents the following statistics display:

```
DIGITAL CARRIER STATUS DISPLAY: Tue Aug 1 12:28:03 1995

TRUNK NO:0   CUR STATE:IN-SYNC  CONFIG:CEPT, HDB3, CCS CLK  REF: TRUNK0

Error Counters - Error Sec.: 0000     OOF:    0004 Slip:    0000 AIS:    0000
11:10:23 08/01/95 Fail Sec.: 0000     Bit Err:0000 Lcl. Alm:0000 Rem Alm:0000
```

Step	*Reference*

3. Press Q to return to the Digital Connectivity Status/ Maintenance Menu.

4. Monitor all digital trunks.

   Select: (A) Monitor all trunks.
   Prompt: Host holding digital board(s):
   Response: The number of the module.
   Prompt: Reset counters (Y/N):
   Response: As required, Y

   The system presents the information shown in Step 2.

5. When done monitoring the trunks, exit to the Main Menu.

Put Digital Trunk Out of Service

VoiceMemo Release 6.0A and later

Digital trunks can be placed into and out-of-service (OOS) for maintenance purposes. When a trunk is placed OOS, the digital trunk interface card automatically sends an AIS to the far end to indicate the OOS state of the trunk.

Step	*Reference*
1. Reach the Digital Connectivity Status/Maintenance Menu.	Menu Map 13

2. Place a trunk out-of-service.

   Select: (D) Place trunk out-of-service
   Prompt: Module holding digital board(s) :
   Response: The number of the module.
   Prompt: Trunk number:
   Response: The number of the trunk of interest.

3. Monitor a selected digital trunk to verify that the trunk is OOS.

   Select: (B) Monitor a single trunk
   Prompt: Module holding digital board(s):
   Response: The number of the module.

   Prompt: Reset counters (Y/N):
   Response: type N
   Prompt: Trunk number:
   Response: The number of the trunk selected in step 2.

   The system presents the following statistics display:

```
DIGITAL CARRIER STATUS DISPLAY: Tue Aug 1 12:28:03 1995

TRUNK NO:0   CUR STATE:OOS  CONFIG:CEPT, HDB3, CCS  CLK REP:  TRUNK0

Error Counters - Error Sec.: 0000     OOF:    0004 Slip:    0000 AIS:    0000
11:10:23 08/01/95 Fail Sec.: 0000     Bit Err:0000 Lcl. Alm:0000 Rem Alm:0000
```

4. Check the CUR STATE of the trunk to ensure that it is out-of-service. If it is not, repeat Step 2 to set it out-of-service. If the trunk status does not change, refer to the Centigram *Series 6* Server *Diagnostics* Manual for troubleshooting information.

5. After you have changed the status of the selected trunk to out-of-service, exit to the Main Menu.

Place a Digital Trunk Into Service

VoiceMemo Release 6.0A and later

Digital trunks can be placed into and out-of-service (OOS) for maintenance purposes. When a trunk is placed OOS, the digital trunk interface card automatically turns off the AIS to the far end to indicate the OOS state of the trunk and restores traffic.

Step	*Reference*
1. Reach the Digital Connectivity Status/Maintenance Menu.	Menu Map 13

2. Place a trunk into service.

   Select: (E) Place trunk out-of-service
   Prompt: Host holding digital board(s):
   Response: The number of the module.
   Prompt: Trunk number:
   Response: The number of the trunk of interest.

3. Monitor a selected digital trunk to verify that the trunk is in service.

   Select: (B) Monitor a single trunk
   Prompt: Host holding digital board(s):
   Response: The number of the module.

   Prompt: Reset counters (Y/N) :
   Response: type **N**
   Prompt: Trunk number:
   Response: The number of the trunk selected in step 2.

   The system presents the following statistics display:

```
DIGITAL CARRIER STATUS DISPLAY: Tue Aug 1 12:28:03 1995

TRUNK NO:0  CUR STATE:IN-SYNC  CONFIG:CEPT, HDB3, CCS  CLK REF: TRUNK0

Error Counters - Error Sec.: 0000   OOF:  0004 Slip:  0000 AIS:  0000
11:10:23 08/01/95 Fail Sec.: 0000   Bit Err:0000 Lcl. Alm:0000 Rem Alm:0000
```

4. Check the CUR STATE of the trunk to ensure that it is in service. If it is not, repeat Step 2 to set it in service. If the trunk status does not change, refer to the Centigram *Series 6 Communications Server Diagnostics Manual* for troubleshooting information.

5. After you have changed the status of the selected trunk to out-of-service, exit to the Main Menu.

T1/E1 Menu Map 13

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(A) Add resource card
Add Board to Database Menu
(A) Dual T1
(B) AG (24/30)
(C) AG 8
(D) ATI
(E) CGRM 2
(F) DUAL El
(G) MTP Processing
(H) Analog FAX
(I) M-VIP FAX (2/4/8)
(X) eXit

(C) Card configuration
Configuration Menu for Board [ ] in AT slot xx
(A) IO Port Address change
Select IO Port Address Menu
(A) 0x300
(B) 0x2300
(T) set Trunk signalling type
Select Trunk Type Menu
(0) Analog_E&M
(1) Analog_E&M Type 1A
(2) Analog_Loopstart
(3) Analog-DID
(4) Analog_Groundstart
(5) Digital-E&M
(6) Digital-Loopstart
(7) Digital-DID
(8) Digital-Groundstart
(9) Digital-CommonChannel
(N) None (digital support)
(X) eXit
(C) Configure T1/E1 carrier
Configuration menu for **T1/E1** Carrier at trunk x
(T) set Trunk number
(F) configure Framing format
Configure Frame Format for Board [ ] in AT slot xx Trunk x Menu
(A) D3/D4 framing
(B) ESF framing
(C) CEPT framing
(D) CRC framing
(X) eXit

(C) Configure Coding format
Configure Frame Coding for Board [ ] in AT slot xx Trunk x
(A) AM1 coding
(B) AMI with ZCS coding
(C) B8ZS coding
(D) HDB3 coding
(X) eXit
(D) Display current configuration
(X) eXit
(F) reset to deFault
(S) Show board configuration
(W) shoW default configuration
(X) eXit

(K) digital card clocK reference
Digital Clock Reference Configuration Menu
(I) set to Internal clock reference
(N) set to Network clock reference
(D) set to Default clock reference
(S) Show current clock reference
(F) show deFault clock reference
(X) eXit

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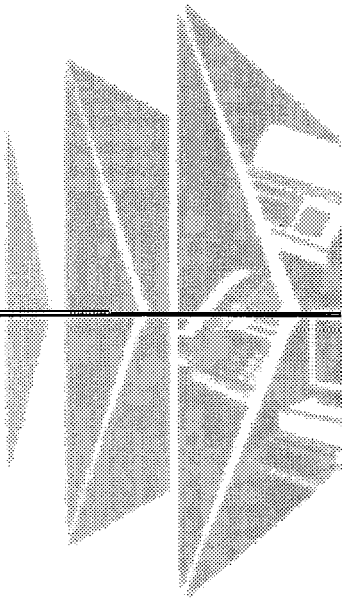
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Voice Processing Solutions

PMS Integration Manual



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Overview of PMS Intearations

This document describes how to install, configure and trouble shoot three of Centigram's PMS integrations. This information is an expanded version of the Appendix G of the Installation and Maintenance manual.

There are three PMS Integrations discussed in this document:

1. The EECO PMS Integration
2. The HIS PMS Integration
3. The Encore PMS Integration

All the integrations provide the same basic features on room check-in and check-out. The EECO and HIS integrations use the same configuration menus to set up these options, the Encore Integration uses additional menus.

All the integrations communicate with the PMS over an RS232 link to determine which rooms have been checked-in or checked-out. The integrations then change the mailboxes of these rooms according to a user defined configuration.

There are three basic steps to the installation.

1. Install the PMS Integration extra cost feature on the VoiceMemo system. This is discussed in the next chapter. Note that the VoiceMemo will then have to be rebooted.

2. Hook up an RS232 link between the VoiceMemo and the PMS. The RS232 connection should be a 9 pin to 25 pin cable with the following straight thru pin outs: 2 to 2; 3 to 3; and 7 to 7. If the distance from the VoiceMemo to the PMS is over 50 feet and the data packets discussed in the following chapters have parity or bit errors, install limited distance line drivers. If a modem is needed to reach a PMS system at another location, a pair of 202 Modems may be appropriate. Contact Centigram's Technical Assistance Center at (408)428-3558 for further guidance.

3. Configure the integration to meet the needs of the specific site. The configuration changes are done on-line and the changes take effect within one minute. This makes the integrations very flexible. See the appropriate following chapters for the type of integration to be used.

The PMS Intearation installation

INSTRUCTIONS: (For all three Integrations (EECO, HIS, Encore)

1. Insert the VoiceMemo serialized PMS Integration diskette in the floppy drive.

2. Execute a (S)ystem Shutdown under the System Maintenance console program, to insure no calls in progress are cut-off. Push the reset button located on the back of the VoiceMemo unit.

3. After console has displayed “BOOT FROM FLOPPY?” DO NOT INPUT ANY RESPONSE! The next command will read, “Run commands from floppy disk? Y/N [N].” Input "Y" followed by a carriage return to proceed with the installation. Please note if users do not input "Y" within 6 seconds, the system will proceed with its normal operation.

4. The floppy drive light and hard drive light will go on and off for a few minutes. Users will see a list of VoiceMemo’s Revision files. Then the message “Enabling extra cost feature. . . .reconfigure system if needed.”

5. The reconfiguration program is automatically invoked. The user will read:

VOICEMEMO CONFIGURATION - MAIN MENU

(N) Online Menu
(F) Offline Menu
(X) Exit

If you need help later, type ?.
COMMAND (N/F/X).

Input an "F" to enter the Offline Menu. Users will view the following:

VOICEMEMO CONFIGURATION - Offline Menu
- - w - e -

(A) Linegroup Only Applications
(L) Linegroup and RS232 Only Applications
(M) RS232 Only Applications
(T) DTMF to PBX Message tights
(D) Pre-Extension Dial String
(G) Define tine Groups
(N) Network Menu
(S) Auto-Gather - System Billing
(Y) System 75 Menu
(W) System 85 Menu
(I) SL-1 /MERIDIAN Menu
(C) Report Current Configuration
(Q) Quit -- Forget Changes
(X) Exit -- Save Changes

Input an "M" for RS232 Only Applications Menu. The next menu will be as follows:

RS232 Only Application
--m----------I---

(P) Serial Port selected = [1] [serial port #1 or #2]
(A) AC Message Waiting Lights (BSR)
(B) BBL Pager
(C) Centigram standard interface
(D) Encore PMS integration
(E) PMS integration [EECO PMS INTEGRATION]
(F) HIS PMS Integration
(H) Hitachi DX
(I) ITT
(R) Programmable
(S) SL-1 background terminal facility
(U) SL-1 multiple message waiting set ports
(T) Tip-Ring Message Waiting Lamps
(V) Video dispatch
(W) Citywide SMDI
(N) No serial port MWI
(X) Exit

Input "P" for the serial port number, choose a serial port and input "E" for EECO PMS integration, "F" for HIS PMS Integration, or "D" for Encore PMS Integration.

User will then read the following (for example):

> PMS integration selected on serial port 1. (Connect cable to VoiceMemo "Serial Port 1" connector). Exit completely out of the Offline Menu. WARNING: REBOOT to enable reconfiguration changes!

Exit completely out of the Offline Menu. Please exit out of the Main Menu as follows:

> MAIN MENU
>
> (M) Mailbox maintenance
> (R) Report generation
> (S) System maintenance
> (X) Exit
>
> COMMAND (M/R/S/X): X

Users will view the following:

> Console shutdown. Hit ctrl - Z to reactivate. Extra cost feature is now installed. . . REBOOT TO START OPERATION....

At this point the VoiceMemo system will automatically REBOOT. The PMS Integration is now installed and must be and configured completely (see appropriate following chapter).

The EECO and HIS PMS Intearation Set-Up

ACCESS:

The PMS menu is accessed off of the Reconfiguration menu that is accesses from the System Maintenance Menu. The menus are as follows:

MAIN MENU

(M) Mailbox maintenance
(R) Report generation
(S) System maintenance
(X) Exit

Enter letter in ( ) to execute command.
When you need help later type ?.

COMMAND (M/R/S/X) : S

SYSTEM MAINTENANCE

(A) Automatic Wakeup
(B) Automated Receptionist Extensions
(D) Display modem passcode
(E) Enable modem/serial port
(F) Floppy backup
(G) Re-synchronize HIS PMS room status
(H) Hard Disk Utilities
(L) tights test
(M) Manual message purge
(N) System name
(P) Passcode
(R) Reconfiguration
(S) System shutdown
(T) Time and date
(U) Utility menu
(V) Call Detail Recorder
(W) Network menu
(X) Exit

Enter letter in ( ) to execute command.
When you need help later type ?.

COMMAND (A/B/D/E/F/G/H/L/M/N/P/R/S/T/U/V/W/X): R

SYSTEM CONFIGURATION

(E) Configure PMS integration
(F) Feature COS
(G) Group COS
(L) Limits COS
(N) Network COS
(P) Phoneline exceptions
(R) Reconfigure system
(V) Configure Video Dispatch
(W) Configure Citywide SMDI
(Y) Configure Smartcard Table
(X) Exit

Enter letter in ( ) to execute command.
When you need help later type ?.

COMMAND (E/F/G/L/N/P/R/V/W/X): E

Users will then view the following:

Answer the following questions to configure the PMS
Clear passcode on Check-out = [Y]
Clear messages on Check-out = [Y]
Clear name on Check-out = [Y]
Clear greeting on Check-out = [Y]
On Check-in set the mailbox FCOS = [0]
On Check-out set the mailbox FCOS = [0]

COMMAND (E/F/G/L/P/R/V/W/X): E

Here is a list of the PMS configuration questions and some help text on them:

Clear passcode on Check-out = [Y]
To have the mailbox passcode cleared on Check-out
enter "Y" otherwise, enter "N"

Clear messages on Check-out = [Y]
To have the mailbox messages cleared on Check-out
enter "Y" otherwise, enter "N"

Clear name on Check-out = [Y]
To have the name messages cleared on Check-out
enter "Y" otherwise, enter "N"

Clear greeting on Check-out = [Y]
To have the mailbox greeting cleared on Check-out
enter "Y" otherwise, enter "N"

On Check-in set the mailbox FCOS = [0]
Enter the Feature Class of Service number between 1 and 64
or enter 0 to prevent the number from being changed.

On Check-out set the mailbox FCOS = [0]
Enter the feature Class of Service number between 1 and 64
or enter 0 to prevent the number from being changed

Mailbox Set Up - EECO Only:

Once the application has been set up, the user must create guest mailboxes with either the Check-out or the Check-in FCOS (it is important to match the existing room status since the integration does not handle a re-synchronization of the databases in VoiceMemo and the Property Management System when it first starts up).

Mailbox Set Up - HIS Only:

Once the application has been set up, the user must create guest mailboxes with either the Check-out or the Check-in FCOS. (It is not critical to match the existing room status since the integration offers a System Maintenance menu choice to provide a re-synchronization of the databases when PMS first starts up). It is important to set the MWI type for the guest mailboxes to be type 16:

Message Waiting Type #1: ?

0: None
1: Not Available
2: AC msg lamp
3: DTMF to PBX

4: Fixed RS232
5: Pager
6: SL-1 BkGround
7: Program RS232
8: T/R RS232
9: Centrex RS232
10: Intecom RS232
11: NEC RS232
12: Video Dispatch
13: ITT RS232
14: Citywide SMDI
15: AT&T System 75
16: HIS PMS
17: SL-1 Msg Waiting

Message waiting type #1 : 16

This is so that the guest room's MW light is controlled by the PMS system. (Note: this integration does NOT preclude the use of another integration running on a different serial port).

After both the configuration and the mailboxes have been set up, the integration will update the room status.

The EECO PMS Integration
Trouble Shootina Guide

1.0 Imolementation

The EECO PMS integration within VoiceMemo polls the Property Management System once a minute in order to find out which rooms have been checked-in/checked-out since the last poll. This information is used to perform user configurable check-in/check-out procedures to mailboxes on the VoiceMemo system. For more information on the VoiceMemo Check-in/Check-out procedures, contact Centigram's Marketing Department. In the following description the VoiceMemo system will be referred to as VoiceMemo.

2.0 Protocol

1) After 60 seconds of no activity VoiceMemo sends an ASCII "C" followed by an ETN ($03).

2) The PMS replies with the character "C" within two seconds.

3) If no reply is received within the two second window up to two additional attempts will be made by VoiceMemo. If there is still no response from the PMS VoiceMemo will return to sleep for 60 seconds and start over at 1.

4) Once the PMS replies it then has 6 seconds to start sending room info packets to VoiceMemo for processing. These packets are as follows:

   A) Stan of record character * ($2A).

   B) Room status character: A = newly checked-in; V = newly checked-out.

   C) Room number followed by the delimiter character semicolon ($3B). Room numbers are in ASCII readable. Only numeric room numbers are supported at this time. Note, at this time the Room number is assumed to be the mailbox number and as such needs to conform to the dial plan. Eventually the ability to translate alphanumeric room numbers to mailbox numbers will be added.

   D) End of record character % ($25).

These packets can be no longer than 80 characters including the start and end of record characters. When there is no more data to send to VoiceMemo, the interface sends the single ASCII character "@" ($40).

5) Upon receiving the packet from the PMS VoiceMemo will then process the information. If the packet is good, all check-in/check-out procedures are carried out and VoiceMemo requests the next packet (ii any) by sending an "M" followed by an ETN ($03). If the packet is bad VoiceMemo re-requests it by sending an "L" followed by an ETX ($03). If the PMS sent the empty reply ("@") VoiceMemo will go back to sleep for sixty seconds without responding to the PMS.

Note: The PMS must first echo the "L" or "M" before sending any other information to VoiceMemo.

6) When the PMS receives either the "L" ETX or "M" ETN requests from VoiceMemo it has six seconds to respond. VoiceMemo will try either of these requests up to three times before giving up and sleeping for sixty seconds before starting at 1) again.

3.0 Physical Characteristics

1) RS-232 compatible signal.

2) 1200 baud.

3) 1 start bit, 1 stop bit, 8 bit data, and no parity.

4) VoiceMemo is configured to be a DCE device.

5) No flow control is supported.

6) Data signals required are transmit data, receive data, logic ground (pin 7), data terminal ready (should always be high).

7) No control signals are used.

4.0 Diagnostic information

See Appendix A for detailed diagnostic information available through the error log file, the CDR file and the system console.

The HIS PMS Integration Trouble Shootina Guide

1.0 Introduction

In order to integrate reliably between the HIS PMS system and the Centigram VoiceMemo voice messaging system, the following protocol has been developed. The protocol contains three layers; physical, link, and message. This protocol conforms to the "HIS Standard Communications Protocol for Full Duplex Operations" fully with the following stipulations:

2.0 . Phvsical Laver

Electrical Interface:	EIA RS232C - Type D electrical standard compatibility. Connection is via a DB25-pin male connector.
Signal Form:	EIARS404.
Interface Distance:	Maximum 50 feet. Interface unit to interface Processing Unit direct connection. Distances exceeding 50 feet require a line driver.
Operation Mode:	Fullduplex.

3.0 Link Laver

Appearance:
Data Rate: 2400 Baud Asynchronous
Byte Framing: 10 bits, (1 start, 7 data, 1 parity, 1 stop), even parity.

4.0 Messaae Laver

There are six messages defined for the protocol as follows:

Message number 1 is RESYNC.
Message number 2 is ROOM OCC
Message number 3 is ROOM VAC/

Message number 4 is MESSAGE WAITING STATUS.
Message number 5 is BAD MAILBOX ADDRESS.
Message number 6 is SEND MESSAGE WAITING STATUS.

5.0 Mailbox Re-synchronization

With the HIS PMS integration an additional menu choice (G) has been added to the System Maintenance Menu to allow the system administrator to re-synchronize the state of all the mailboxes being supported by the PMS.

6.0 Messaae Waiting

The HIS PMS integration supports message waiting notification through the PMS system. A message waiting type has been added to the system called “HIS PMS." See Chapter 6, section 3 for an example of this.

7.0 Diagnostic information

See Appendix A for detailed diagnostic information available through the error log file, the CDR file and the system console.

Encore Configuration and Trouble Shooting

1.0 Introduction

The Hyatt Encore PMS is an extra cost feature enhancement that allows integration between VoiceMemo and the Encore Property Management System.

Under this integration it is possible to not only automatically assign vacant and occupied mailboxes to guests (checked in or out), but it also allows for room reassignment and text message waiting indication.

The VoiceMemo to Hyatt Encore PMS Integration is designed to offer the Hotels a reliable and simple way of relaying communication between the voice messaging system (VMS) and the property management system (PMS).

It is designed to work with VoiceMemo Release 5.00 and later releases of software.

This integration provides:

1.1 Check In - Automatic check in of a guest mailbox upon arrival (PMS to VMS message)

1.2 Text Message Notification - VMS notification of number of text messages in the PMS.

1.3 Message Waiting Indication - Automatic voice message waiting indication (controlled by the PMS)

1.4 Played Message indication - Automatic signaling from the VMS to the PMS when a message is played.

1.5 Multiple Classes of Service - Allows the automatic check in of guests with different classes of service which may include different language prompts.

1.6 Check Out - Automatic check out of a mailbox, by disposing of any recorded messages, recorded name (ii any), or recorded mailbox greeting (if any).

1.7 Mailbox Modify - The Hotel should be able to modify the mailbox number of a particular guest without losing any of the recorded information in that mailbox.

2.0 Configuration

See Chapter 2 for initial configuration information.

Once the application has been setup it is also necessary to access the following Menus:

SYSTEM CONFIGURATION

(E) Configure PMS integration
(F) Feature COS
(G) Group COS
(L) Limits COS
(N) Network COS
(P) Phoneline exceptions
(R) Reconfigure system
(V) Configure Video Dispatch
(W) Configure Citywide SMDI
(Y) Configure Smartcard Table
(X) Exit

Enter letter in ( ) to execute command.
When you need help later type ?.

COMMAND (E/F/G/L/N/P/R/V/W/X): E

Users will then view the following:

Answer the following questions to configure the PMS
Clear passcode on Check-out = [Y]
Clear messages on Check-out = [Y]
Clear name on Check-out = [N]
Clear greeting on Check-out = [N]
On Check-in set the mailbox FCOS = [0] 2
On Check-out set the mailbox FCOS = [0] 64

3.0 Mailbox Setup

Once the application has been setup, the user must create guest mailboxes with either the Check-Out or Check-In FCOS (it is not critical to match the existing room status since the integration handles a re-synchronization of the databases when it first starts up). It is important to set the MWI type for the guest mailboxes to be type 16:

Message Waiting Type #1: ?

0: None
1: Not Available
2: AC msg lamp
3: DTMF to PBX
4: Fixed RS232
5: Pager
6: SL-1 BkGround
7: Program RS232
8: T/R RS232
9: Centrex RS232
10: Intecom RS232
11: NEC RS232
12: Video Dispatch
13: I-T-T RS232
14: Citywide SMDI
15: AT&T System 75
16: HIS PMS
17: SL-1 Msg Waiting

Message waiting type #1: 16

This is so that the guest room's MW light is controlled by the PMS system. (Note: this integration does NOT preclude the use of another integration running on a different serial port).

After both the configuration and the mailboxes have been set up, the integration will update the room status.

4.0 Text MWI

As a new PMS feature, it is possible for a guest to find how many (if any) text messages are waiting at the front desk (in the PMS system). This is done both upon login and logout of the mailbox:

> "Hello <name >, you have N unplayed messages, 2 messages total. X text messages at the front desk. Press P to play the first message...'
>
> "You have 3 messages remaining." (No prompting done when there are NO text messages.)

This announcement of text messages is controlled with a new FCOS Feature Bit 154:

> "Announce text (E-Mail) message count."

5.0 Installation

Use the extra cost feature diskette for both the enabling of the feature and with the Hard Disk Maintenance Menu choice of "prompts.add" to add the following additional prompts:

Prompt 2131: <One > "text message" <at the front desk>.

Prompt 2182: <Two > "text messages" <at the front desk >.

Prompt 2183: <Two text messages > "at the front desk." **

***Note: This prompt can be replaced with an optional: "in your E-Mail System."*
***Note: Only English prompts support this prompt.*

6.0 Console Administration

Presently only the Hyatt Encore PMS has control over the Text message count field in the user's mailbox. This count can be monitored via the Mailbox Dump utility. The new field now shows immediately following the network statistics/billing fields:

Sent_urg_msgs	= 0	Tas_msgs	= 0	Pages	= 0		
Receipt	= 0	Sent-to-node	= 0	Urg_to_node	= 0		
Net_urg_mlen	= 0	Net_msgs_rcv	= 0	Net_urg_rcv	= 0		
Net_sent_node	= 0	Net-send_nurg	= 0	Net-send-rep	= 0		
Greet_count	= 0	Successlogins	= 0	Recpt_calls	= 0		
Recpt_complt	= 0	Recpt_busy	= 0	Recpt_rna	= 0		
Recpt_msgs	= 0	Recpt_attend	= 0	User_connect	= 0		
Clr_connect	= 0	Callp_connect	= 0	Disk_use	= 0		
Net_sent_mlen	= 0	Net_rcvd_mlen	= 0	Net_rcvd_urg	= 0		
Net_node_mien	= 0	Net_recip_mlen	= 0	Net-node-urg	= 0		
Text_msg_cnt	= 3						

Message Queues:

Type	Count	Total	Head	Tail	Type	Count	Total	Head	Tail
Free	73	--	0	72	Unplayed	0	---	-1	-1
Played	0	a-	-1	-1	Urgent	0	---	-1	-1
Receipts	0	---	-1	-1	Undelivered	0	--	-1	-1
Future delivery	0	---	-1	-1	Call placmt	0	---	-1	-1

If this field is other than 0, it will be displayed every time a full mailbox report is run (either when deleting, modifying, searching, etc), under a new field called "TEXT MW" (text messages waiting):

```
MAILBOX: 100
   MSGS: 0          UNPLAYED: 0          URGENT: 0          RECEIPT: 0
   LCOS: Default             : 1           FCOS: Unlimited          : 1
   GCOS: Defautt GCOS  1     : 1           NCOS: Default            : 1
BAD LOGS: 0       LAST LOG: 05/04/90 1:26 pm                 MINS: 0.0
 PASSWD: N           TUTOR: N             DAY: M             NIGHT: M
   NAME:                                  CODE:
   EXTEN: 100                             INDEX: 0           TEXTMW: 2
ATTEN DN:                                 INDEX: 0
 ACCESS: None
```

7.0 Batch Mode

A new batch mode program /cmds/atext now exists in order to change/query this new field via the console.

The following is a set of examples that demonstrate its usage:

```
$ atext ?
use: atext ml = [start]mailbox t=text_count [m2=end_mailbox] [ +verbose]
$ atext

Set text count for mailbox: ?
        Enter a number in the range, 1 to 99999999999
        or a range of mailboxes separated by a hyphen

Set text count for mailbox: 100
New text count (O-255) [2]: ?
        Text count is used to announce user of an existing electronic
        message waiting at either the hotel/motel front desk or at the user's
        E-mail system.  User must have the correct FCOS to allow
        announcement.
New text count (O-255) [2] :
Set text count for mailbox:
$ atext

Set text count for mailbox: 100
New text count (O-255) [3] : 2

Set text count for mailbox:
$ atext m1=101 t=2
$ atext ml =102 t=1 +v
        Mailbox 102: Text count set to 1
$ atext

Set text count for mailbox:  103-l05
New text count (O-255): 5

Set text count for mailbox:
$ atext ml=103 m2=105 +v t=3
        Mailbox 103: Text count set to 3
        Mailbox 104: Text count set to 3
        Mailbox 105: Text count set to 3
        3 Mailboxes affected
```

Note that when an individual mailbox is modified, the actual text count is shown.

8.0 Communication Description

This integration is based on communication between the PMS and VMS via an RS232 Full Duplex link. The connection should be a DB25 pin male connector.

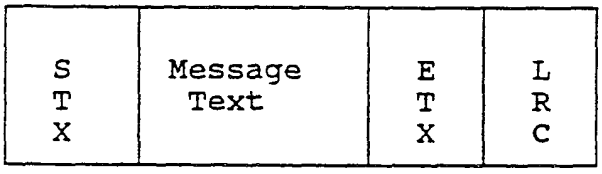
8.1 link Setup

Baud = 1200 Asynchronous, Bits = IO, (Start = 1, Data = 7, Parity = 1, stop = 1) Panty = Even.

Note: A Null Modem adapter may be needed with an Encore PMS Integration. Test the RS232 link without *one,* and *if the data packets are not received correctly, install a Null Modem Adapter.*

9.0 Messaae Formats

Each fixed length record will contain:



All messages start with an STX, followed by the message text. All message text must be followed by ETX and the last byte LRC, to guarantee integrity.

ACK and NAK are sent by the receiver to the sender to indicate positive or negative acknowledgement to the transmitted message. A NAK should be used by the message sender as a request to retransmit the last message sent. ENQ is a sender request for a repeat of the acknowledgement (ACK or NAK) as a reply to the last transmitted message.

The following is a summary table of the valid data transferred between the PMS and the VMS:

STX	=	02H Start of data text
El-x	=	03H End of data text
ENQ	=	05H Request for retransmission of acknowledgement
ACK	=	06H Positive acknowledgement
NAK	=	15H Negative acknowledgement
SP	=	20H ASCII space character (to padd fields)
LRC	=	Longitudinal redundancy check (XOR of all bytes after STX including the ETX character, with a OOH Null seed)
MBOX	=	A 6 digit (left justified and space filled) mailbox ASCII number
M S G	=	"1" RESYNCHRONIZE "2" CHECK IN "3" CHECK OUT "4" MESSAGE WAITING STATUS "5" BAD MAILBOX ADDRESS "6" QUERY MESSAGE WAITING STATUS "7" MOVE MAILBOX "8" MODIFY FCOS "9" TEXT MESSAGE MW Where the message is sent in hex (ex: "4" is 34H). See Message Format Table (Table 1.0)
FCOS	=	A 2 byte number (00-64) representing the Feature Class of Service to use when modifying the mailbox (set up via the console configuration menus)
UNP	=	A 2 byte number (00-99) representing the number of unplayed messages in the guest mailbox (valid ranges 30H to 39H)
URG	=	A 2 byte number (00-99) representing the number of all unplayed messages with URGENT priority found in the guest mailbox (valid ranges 30H to 39H)
UNR	=	A 2 byte number (00-99) representing the number of unread text messages in the PMS system (valid ranges 30H to 39H)

Note: All messages are of a fixed length record (76 bytes), space padded.

10.0 Diagnostic Information

See Appendix A for detailed diagnostic information available through the error log file, the CDR file and the system console.

	Message Text														
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STX	"1"	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	ETX	LRC
STX	"2"	MBOX						SP	SP	SP	SP	SP	SP	ETX	LRC
STX	"3"	MBOX						SP	SP	SP	SP	SP	SP	ETX	LRC
STX	"4"	MBOX						UNP		URG		SP	SP	ETX	LRC
STX	"5"	MBOX						SP	SP	SP	SP	SP	SP	ETX	LRC
STX	"6"	MBOX						SP	SP	SP	SP	SP	SP	ETX	LRC
STX	"7"	MBOX						MBOX						ETX	LRC
STX	"8"	MBOX						FCOS		SP	SP	SP	SP	ETX	LRC
STX	"9"	MBOX						UNR		SP	SP	SP	SP	ETX	LRC

Table 1.0 Message Format Table

Appendix A

HIS and Encore Diagnostic Specification

CENTIGRAM COMMUNICATIONS CORPORATION

Diagnostic Specification

Part Number 2750-0009-01 Rev A

June 24, 1991

Prepared by Walter Croft

HIS/Encore PMS Integration

References:

Centigram Document Part No. 2750-0009-00
"VoiceMemo/Encore PMS Integration ENGINEERING SPECIFICATION"

Definitions:

ACK:	An ascii control character used in the RS232C serial protocol for positive acknowledgement of a single character or full message packet.
CDR:	A group of routines, data and files that allow the VoiceMemo system to do call detailed recording of selected information for diagnostics.
cdrmenu:	A VoiceMemo routine that runs only when the system administrator requests to inspect or modify the CDR log file and/or configuration.
EECO:	An OAA record that stores the configured data set up by eecomenu.
ENQ:	An ascii control character used in the RS232C serial protocol. It is used to request retransmission of the Iast character or full message packet.
eecomenu:	A VoiceMemo routine that runs only when the system administrator requests to inspect or modify the EECO OAA record for the HIS/Encore PMS integration.
hisinit:	A VoiceMemo routine that is started by hissnd to read though all mailboxes on the system and update message waiting for any with message waiting type 16.
hismwi:	A VoiceMemo routine that receives message waiting update requests from the mwla, reformats the data and requests hissnd to transmit the message across the serial link to the PMS system. Upon completion it reports the status back to the mwla.
hisrcv:	A VoiceMemo routine that receives the serial link data from the PMS system.
hisresync:	A VoiceMemo routine that is started by hisrcv if it receives a resync message from the PMS system. It sends a message to hissnd to start hisinit and then dies.
hissnd:	A VoiceMemo routine that sends data across the serial link to the PMS system.
mwla:	A VoiceMemo routine that oversees message waiting updates for all the message waiting integrations.
NAK:	An ascii control character used in the RS232C serial protocol for negative acknowledgement of a single character or full message packet.
OAA:	Open Account Administrator. The method to store VoiceMemo mailbox and configuration data in 4K records.
PMS:	Property Management System.
TTY:	Tela-typewriter.

The purpose of this document is to explain the available diagnostic information for the HIS/Encore PMS Integration. The information is located in three areas: the log tile, the CDR file and the system console. Any messages that are displayed on the system console are from the running tasks hissnd, hisrcv, hismwi or hisinit showing that they aborted and why.

Log File:

When VoiceMemo is running there are two possibilities: the link is up or the link is down. When VoiceMemo is booted, the PMS system integration software starts with the assumption the link is up. If the VoiceMemo system sends any data over the Iii to the HIS/Encore PMS system and it is not acknowledged Within two seconds, the data is resent for a maximum of four times. If still no acknowledgement, the VoiceMemo system considers the link down and logs it. At any future time if the HIS/Encore PMS system sends valid data to the VoiceMemo system, it is acknowledged and the link is considered up and it is logged.

At any time while VoiceMemo is running, if a message waiting notification sent to the HIS/Encore PMS system fails due to an internal error, the mailbox number and message waiting state lost is logged.

If the VoiceMemo system is requested to do a move message command (swap) and for any reason the event fails it is logged with both the source and destination mailbox numbers. It is also possible during a swap that the source mailbox is deleted and can not be recreated. If this event occurs, it is logged with the mailbox number that is deleted.

To check the log file for information including HIS/Encore PMS integration, complete the following.

From the console main menu enter (R) Report generation
then enter (L) Log file
then enter (S) Show logfile

To display the contents of the log file, possibly including information for the HIS/Encore PMS integration.

Log File Entries:

"HIS PMS Link is up"
"HIS PMS Lii is down"
"Unable to update MWI (ON/off) for mailbox (x)"
"Failed to swap mailbox (x) with (y)"
"Deleted mailbox (x), unable to re-create"

CDR Fife:

While the VoiceMemo system is running, cdrmenu provides an interface to cause selected information to be written to a CDR log file. For the HIS/Encore PMS system interface, one new CDR level has been added to allow diagnostic monitoring. The additional level is 22, HIS/EECO/Encore PMS. It is useful to have this level active for short periods of time for full diagnostic monitoring of the integration. Disk space on drive 4 is required to allow logging into the CDR file. If drive 4 becomes 100% full, the CDR log file and the log file will loose additional information king written to these files. Listed below are methods to operate CDR and monitor drive 4 dish space.

The data logged is from one of three active tasks and two short lived spanned tasks that make up the running programs of the HIS/Encore PMS system interface. The names of the tasks are hissnd, hisrcv, hismwi, hisinit and hisresync where hisinit and hisresync are the short lived spanned tasks. Each of these tasks when enabled with CDR level 22 logs data to the CDR file for specific events. Data logged by hissnd starts with "hissnd:" in the CDR file. Data logged by hisrcv starts with "HISRCV:" in the CDR.

file. Data logged by hismwi starts with "HISMWI:" in the CDR file. Data logged by hisinit starts with "hisinit: " in the CDR file. Data logged by hisresync starts with "HISRESYNC:" in the CDR file.

To log diagnostics for HIS/Encore PMS integration with the Call Detail Recorder, complete the following.

From the console main menu enter (S) System Maintenance
then enter (V) Call Detail Recorder
then enter (C) Configure CDR

For Host lines, make sure line zero is configured. For EVMON Host lines, the selected data is not referenced. For message levels, enable 22 HIS/EECO/Encore PMS. Enable CDR and select a name for the CDR log data tile.

then enter (R) Run CDR

Do testing of the HIS/Encore PMS integration.

then enter (S) Show CDR log file

View the CDR log file and confirm consistent results with system integration testing.

then enter (D) Delete CDR log file

To remove accumulated data. repeat these last two steps as required.

then enter (T) Terminate CDR

Turn off the logging of diagnostic information to the CDR log file.

To monitor drive 4 disk space, complete the following.

From the console main menu enter (S) System Maintenance
then enter (U) Utility Menu
then enter (T) Task
then enter (query 4)

One line displays the number of bytes free, number of bytes used, percentage full, number of blocks free, number of blocks full and the total number of blocks on drive 4. To free up additional space, the CDR log file and/or the log file may be deleted. It is recommended to scan the contents of the files before deleting either one.

As an alterative to sending messages and deleting messages from a mailhox to activate message waiting type 16 for HIS/Encore PMS integration, complete the following.

From the console main menu enter (S) System Maintenance
then enter (L) Lights test

Enter the mailbox number and message waiting setting to be sent out. This testing tool causes the message waiting notification to be sent across the link to the PMS system without the need to send messages too or delete messages from a mailbox.

Level 22, HIS/EECO/Encore PMS:

Messages logged at this level are logged for link and program level diagnostics. This level of diagnostics should not run on an unmonitored system. The CDR data logged is of a large quantity and may cause problems with disk utilization.

Some of the error messages logged are followed by task aborts. These messages are identified below by an additional comment line bracketed with asterisks. Any of the tasks below may abort, either during a system boot or while the system is in full operation. Only the tasks hissnd, hisrcv and hismwi will be restarted. It may he that the task immediately aborts again for the same or another error condition. After five aborts of a task, the system will auto reboot to try and solve the problem by reinitialization. The reason for the task abort is reported to the console and if CDR logging is enabled also to the CDR log file.

hissnd:

"hissnd: Lii is up"
(Link failure recovery)

"hissnd: Link is down"
(Link failure)
This data is logged at the same time and for the same reason as it is defined in the log file section above.

"hissnd: Lii down condition, timeout"
(Link failure)
This data is logged if after sending any form of message across the link, the PMS system does not reply even after four attempts. At this point the link is logged as down.

"hissnd: Configuration change"
(Normal operation)
This data is logged after a message from eecomenu reports that the system administrator has changed the check-in or check-out mailbox configuration data. This information is passed on to hisrcv so it will reread the information from the disk file. It is this communication that allows changes to check-in and check-out handling without a system reboot.

"hissnd: Got send resync message"
(Normal operation)
This data is logged when hissnd is redirected a message from hisresync via hisrcv. VoiceMemo sends a resync message out on the RS232C serial link to the PMS system.

"hissnd: Got send MWI"
(Normal operation)
This data is logged when hissnd is redirected a message from hismwi via hisrcv to update a mailboxes message waiting. VoiceMemo sends a MW status message with the requested mailbox number, number of urgent and number of unplayed messages out on the RS232C serial link to the PMS system.

"hissnd: Got send bad mailbox"
(Mailbox undefined in database)
This data is logged when hissnd is told by hisrcv to report the bad mailbox number. VoiceMemo sends a bad mailbox message out on the RS232C serial link to the PMS system.

"hissnd: Store MWI command"

(Normal operation)
This data is logged when hissnd is actively sending or hisrcv is actively receiving a message from the PMS system when a got send MWI command is delivered. The message can not be directly sent out over the link and is saved until the link becomes idle. Once idle, the MW status command is sent out and the entry is removed from the saved message state. At most one MW update can be held at any one time. This is because the mwla is not replied to until the MW status message is sent out, weather it was temporarily held on an active link state or not.

"hissnd: Add to bad mailbox queue"
(Normal operation)
This data is logged when hissnd is actively sending or hisrcv is actively receiving a message from the PMS system when a got send bad mailbox is delivered. The message can not be directly sent out over the link and is saved until the link becomes idle. Once idle, the MW status command is sent out and the entry is removed from the saved message state. The entries are queued up and sent out in order as the link idle state permits. if the queue is full, any new bad mailbox messages are lost.

"hissnd: Send ACK"
(Normal operation)
This data is logged immediately after one character is transmitted over the RS232C serial link. The character sent is an <ACK>, hex 06.

"hissnd: Send NAK"
(Normal operation)
This data is logged immediately after one character is transmitted over the RS232C serial link. The character sent is a <NAK>, hex 15.

"hissnd: Send ENQ"
(Normal operation)
This data is logged immediately after one character is transmitted over the RS232C serial link. The character sent is an <ENQ>, hex 05.

"hissnd: Send (h)"
(Internal error, report condition)
This data is logged immediately after one character is transmitted over the RS232C serial link. The character sent is in error and its value in hex is shown.

"hissnd: (m)"
(Normal operation)
This data is logged immediately after one data packet is transmitted over the RS232C serial link. The packet sent should be of the form: <STX> message < ETX> LRC = 1.

"hissnd: Received a bad request"
(Internal error, report condition)
This data is logged when hissnd receives an unknown request from another task on the VoiceMemo system. The task hissnd tries to get that task to be reset in an attempt to keep the condition from reoccurring.

"hissnd: Use hissnd Sport [+hyatt]"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart

This data is logged when hissnd is started without a port first parameter. The +hyatt is the optional setting that tells the software to interface to an Encore PMS system at 1200 baud. Without the setting, the software assumes to interface to a HIS PMS system at 2400 baud.

"hissnd: Bad RS232 port name"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hissnd is started with an undefined port parameter.

"hissnd: Unable to attach port"
(Internal error or configuration error, check configuration and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hissnd is started with a port number that can not be attached by this task. Check the configuration of all CPU serial ports of the system for conflicts. If the configuration is altered to repair the problem, reboot the system and monitor for reoccurrence.

"hissnd: Unable to attach name"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hissnd is started and is not able to attach a task name for its use.

"hissnd: Unable to open serial port"
(Internal error or serial port error, check serial port and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hissnd is started and it is not able to *open* the serial port that it just attached to this task.

"hissnd: Unable to get stty on RS232 port"
(Internal error or serial port error, check serial port and report condition)
Error condition causes abort, error displayed oa console and task restart
This data is logged when hissnd is started and it is not able to get the current TTY options of the serial port.

"hissnd: Unable to SET stty on RS232 port"
(Internal error or serial port error, check serial port and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hissnd is started and it is not able to set the desired TTY options of the serial port. This includes baud rate, parity, data and stop bit settings.

"hissnd: Unable to SET device attributes for RS232 port"
(Internal error or serial port error, check serial port and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hissnd is started and it is not able to set the desired device attributes for the serial port. This includes disabling break, X-on/X-off, escape and other features.

hisrcv:

"HISRCV: Checked in mailbox (x)"
(Normal operation)
This data is logged when the PMS system sends valid data to change the configuration of mailbox (x). The changes to the mailbox are configured for FCOS. The changes to the mailbox are complete.

"HISRCV: Checked out mailbox (x)"
(Normal operation)
This data is logged when the PMS system sends valid data to change the configuration of mailbox (x). The changes to the mailbox are FCOS, password, name recording, greeting #1 and messages. The changes to the mailbox are complete.

"HISRCV: Swapped mailbox (x) with (y)"
(Normal operation)
This data is logged when the PMS system sends valid move mailbox data to move source mailbox (x) to destination mailbox (y). Destination mailbox (y) is also swapped to source mailbox (x). The fields that are swapped are FCOS, password, text message count, all four mailbox greetings, name recording and all messages and message data.

NOTE: because all message data is swapped, if messages in the mailbox are from other mailbox users (as apposed to outside callers), the source of the message may play as the wrong user name. This will happen if mailbox 100 sends a user message to mailbox 200 and then swaps to 101. At this time, the name recording for room 101 is now in 100 and so if user 200 listens to the source of the message it will say the name now associated with 100 (the old 101), the wrong name recording. This is not a problem when a message is left by an outside caller or with integrations that do not supply the calling number.

"HISRCV: Modified FCOS (f), MBOX (x)"
(Normal operation)
This data is logged when the PMS system sends valid modify FCOS data packet. The FCOS number of the mailbox is updated to the requested value.

"HISRCV: Text update COUNT (c), MBOX (x)"
(Normal operation)
'This data is logged when the PMS system sends valid text message data packet. The text message count of the mailbox is updated to the requested value.

"HISRCV: Received a BAD MAILBOX (x)"
(Mailbox undefined in database)
This data is logged if the PMS system sends any message packet that includes an undefined source mailbox number. It is invalid because the mailbox passed could not be found in the VoiceMemo database. This message is discarded. No change to the mailbox database is made. The VoiceMemo system responds by sending a bad mailbox packet to the PMS system

"HISRCV: Received a BAD NEW MAILBOX (x)"
(Mailbox undefined in database)
This data is logged if the PMS system sends a move mailbox message packet that includes an undefined destination mailbox number. It is invalid because the mailbox passed could not be found in the VoiceMemo database. This message is discarded. No change to the mailbox database is made. The VoiceMemo system responds by sending a bad mailbox packet to the PMS system.

"HISRCV: Received a BAD NEW MAILBOX (same number)"
(Error in PMS system)
This data is logged if the PMS system sends a move mailbox message packet that includes the same source and destination mailbox number. This message is discarded. No change to the mailbox database is made. The VoiceMemo system responds by sending a bad mailbox packet to the PMS system.

"HISRCV: No check in FCOS configured"

(Check VoiceMemo system configuration, Configure PMS integration)
This data is logged if VoiceMemo reads nonconfigured or invalid data configured for the PMS integration in the EECO OAA record.

"HISRCV: No check out or bad configuration"
(Check VoiceMemo system configuration, Configure PMS integration)
This data is logged if VoiceMemo reads nonconfigured or invalid data configured for the PMS integration in the EECO OAA record.

"HISRCV: Unable to lock source mailbox (x)"
(Internal error, report condition)
This data is logged when hisrcv is unable to lock the source mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to open source mailbox (x)"
(Internal error, report condition)
This data is logged when hisrcv is unable to open the source mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to delete source mailbox (x)"
(Internal error, report condition)
This data is logged when hisrcv is unable to delete the source mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to lock destination mailbox (x)"
(Internal error, report condition)
This data is logged when hisrcv is unable to lock the destination mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to open destination mailbox (x)"
(Internal error, report condition)
This data is logged when hisrcv is unable to open the destination mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to close destination mailbox (x)"
(Internal en-or, report condition)
This data is logged when hisrcv is unable to close the destination mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to create swapped source mailbox (x)"
(Internal en-or, report condition)
This data is logged when hisrcv is unable to create the swapped source mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Unable to re-create original source mailbox (x)"
(Internal error, report condition)
This data is logged when hisrcv is unable to re-create original source mailbox record as part of the move mailbox message sent by the PMS system.

"HISRCV: Failed to swap mailbox (x) with mailbox (y)"

(Internal error, report condition)
This data is logged when hisrcv is unable to swap the source and the destination mailbox records during a move mailbox. This message follows the specific reason listed above listing the level of the failure in the swap.

"HISRCV: Invalid FCOS request (f)"
(PMS system error)
This data is logged when hisrcv receives an invalid FCOS value in a modify FCOS message sent by the PMS system.

"HISRCV: Received an <ENQ> = send <NAK>"
(Link failure, test link protocol using data scope)
This data is logged when hisrcv reads a first character from the RS232C serial port and it is an <ENQ>. This choice to send out a C NAK > is made if VoiceMemo has already sent a message four times and the PMS system continues to reply with an <ENQ> rather than the expected positive result <ACK>. The information is sent by hisrcv to hissnd.

"HISRCV: Received an < ENQ > = send last msg"
(Link failure, test link protocol using data scope)
This data is logged when hisrcv reads a first character from the RS232C serial port and it is an <ENQ>. This choice to send out the last message is made if VoiceMemo has not sent this message four times with the PMS system continuing to reply with an < ENQ > rather than the expected positive result < ACK >. The information is sent by hisrcv to hissnd.

"HISRCV: Received an < ACK >"
(Normal operation)
This data is logged when hisrcv reads a first character from the RS232C serial port and it is an <ACK>. The information is sent by hisrcv to hissnd.

"HISRCV: Received a <NAK>"
(Link failure, test link protocol using data scope. If error is not consistent, suspect PMS system overload or *stressed* RS232C data connection)
This data is logged when hisrcv reads a first character from the RS232C serial port and it is a <NAK>. The information is sent by hisrcv to hissnd.

"HISRCV: (data packet)"
(Normal operation)
This data is logged when hisrcv reads in any packet that begins with an <STX>. This message is displayed if it is a good or bad packet. The packet is shown in the format <STX>message<ETX>LRC=(h).

"HISRCV: BAD LRC"
(Link failure, test link protocol using data scope)
This data is logged when hisrcv reads a packet from the RS232C serial port and the LRC passed in the packet does not match hisrcv's calculated LRC. LRC is defined as longitudinal redundancy check (XOR of all bytes after <STX> including the <ETX> character, with a 00Hex null seed).

"HISRCV: Received a Resynchronize"
(Normal operation)
This data is logged when hisrcv reads a good resynchronize packet from the RS232C serial port.

"HISRCV: Received a Check-in or Check-out"

(Normal operation)
This data is logged when hisrcv reads a good cheek-in or check-out packet from the RS232C serial port.

"HISRCV: Received a Message Waiting Status"
(Normal operation)
This data is logged when hisrcv reads a good message waiting status packet from the RS232C serial port.

"HISRCV: Received a Move Mailbox"
(Normal operation)
This data is logged when hisrcv reads a good move mailbox packet from the RS232C serial port.

"HISRCV: Received a Modify FCOS"
(Normal operation)
This data is logged when hisrcv reads a good modify FCOS packet from the RS232C serial port.

"HISRCV: Received a Text Message MW"
(Normal operation)
This data is logged when hisrcv reads a good text message MW packet from the RS232C serial port.

"HISRCV: Received a bad packet"
(Link failure, test link protocol using data scope)
This data is logged when hisrcv reads a bad packet from the RS232C serial port. The information is sent by hisrcv to hissnd. The partial packet is displayed in a preceding message showing what data has been received, complete or incomplete.

"HISRCV: Received < STX > and then a timeout"
(Link failure, test link protocol using data scope. If error is not consistent, suspect PMS system overload or stressed RS232C data connection)
This data is logged when hisrcv gets a two second timeout while trying to read the full packet length from the RS232C serial port. The data is thrown away and hisrcv resets to look for a first character.

"HISRCV: Received a good mailbox"
(Normal operation)
This data is logged when hisrcv reads a good mailbox number in a check-in or check-out packet. The mailbox was able to be found in the open account database.

"HISRCV: Check in packet (x)"
(Normal operation)
This data is logged when hisrcv reads a good check-in packet. The extension number (x) in the packet is used to read in the mailbox and change the state of the mailbox depending on the hismenu configuration. If hissnd has sent hisrcv a configuration change message, the data stored on disk by hismenu is reread before the changes to the mailbox are made. This allows the system manager to change how check-in and check-out effect mailboxes without a VoiceMemo system reboot.

"HISRCV: Check out packet (x)"
(Normal operation)
This data is logged when hisrcv reads a good check-out packet. The extension number (x) in the packet is used to read in the mailbox and change the state of the mailbox depending on the hismenu configuration. If hissnd has sent hisrcv a configuration change message, the data stored on disk by hismenu is reread before the changes to the mailbox are made. This allows the system manager to change how check-in and check-out effect mailboxes without a VoiceMemo system reboot.

"HTSRCV: Request MW for mailbox (x)"
(Normal operation)
This data is logged if a valid check-out packet with an extension number that lead to a good mailbox was received. And if the current configuration in hismenu for the check-out packet is configured to delete all messages in the mailbox. A message is sent to the mwla to eventually return to hissnd turn off this station numbers message waiting.

"HISRCV: Ignored bad start character, HEX (h)"
(Link failure, test link protocol using data scope)
This data is logged if hisrcv is looking for a start character and the character read in from the RS232C serial port is unknown. Valid start characters are <ENQ>, <ACK>, <NAK> and <STX>. The received unknown start character is displayed in hex and the packet is labeled bad.

"HISRCV: Incomplete packet"
(Link failure, test link protocol using data scope)
This data is logged when the first characters of the packet (<STX>) has been read in successfully, but the two second packet timer expires before the full number of characters for a packet are read. The packet is labeled bad. The partial packet is displayed in a preceding message showing what data has been received, complete or incomplete.

"HISRCV: Unable to locate hissnd"
(Internal error, may locate next transmission, else report condition)
This data is logged when hisrcv needs hissnd to send data allowing the link to stay active but 'the task hissnd can not be found by name. Each time data is received over the data link from the PMS system, hisrcv retries to locate hissnd. If it is again unsuccessful, this message is again logged. At this point, the PMS system sees the link as down. When hissnd successfully restarts and attaches it's name, hisrcv and hisrnwi can locate it and link communication will proceed as expected

"HISRCV: Unable to locate hissnd, data lost"
(Internal error, message lost, report condition)
This data is logged when hisrcv needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. The data is lost and hisrcv continues to run looking for further link data. The PMS system is probably not getting any data from hissnd and so it will consider the link down. When hissnd successfully restarts and attaches it's name, hisrcv and hismwi can locate it and link communication will proceed as expected.

"HISRCV: Unable to send to hissnd, data lost"
(Internal error, message lost, report condition)
This data is logged when hisrcv needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. The data is lost and hisrcv continues to run looking for further link data. The PMS system is probably not getting any data from hissnd and so it will consider the link down. When hissnd successfully restarts and attaches it's name, hisrcv and hismwi can locate it and link communication will proceed as expected.

"HISRCV: Unable to re-send to hid, data lost"
(Internal error, message lost, report condition)
This data is logged when hisrcv needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. It tries to send once to hissnd and fails, then it is temporarily able to attach by name to hissnd again, tries to send a second time and tails. The data is lost and hisrcv continues to run looking for further link data. The PMS system is probably not getting any data from

hissnd and so it will consider the link down. When hissnd successfully restarts and attaches it's name, hisrcv and hismwi can locate it and link communication will proceed as expected.

"HISRCV: Unable to read eeco OAA record"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisrcv is started and it is not able to read from disk the configuration data set by hismenu.

"HISRCV: Use hissnd $port [+hyatt]"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisrcv is started without a Port first parameter. The +hyatt is the optional setting that tells the software to interface to an Encore PMS system at 1200 baud. Without the setting, the software assumes to interface to a HIS PMS system at 2400 baud.

"HISRCV: Bad RS232 port name"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisrcv is started with an undefined port parameter.

"HISRCV: Unable to open serial port"
(Internal error or serial port error, check serial port and report condition)
*Error condition causes abort, error displayed on console and *task restart**
This data is logged when hisrcv is started and it is not able to open the serial port that it just attached to this task.

"HISRCV: Unable to get stty on RS232 port"
(Internal error or serial port error, check serial port and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisrcv is started and it is not able to get the current TTY options of the serial port.

"HISRCV: Unable to SET stty on RS232 port"
(Internal error or serial port error, check serial port and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisrcv is started and it is not able to set the desired TTY options of the serial port. This includes baud rate, Parity, data and stop bit settings.

"HISRCV: Unable to SET device attributes for RS232 port"
(Internal error or serial port error, check serial Port and report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisrcv is started and it is not able to set the desired device attributes for the serial port. This includes disabling break, X-on/X-off, escape and other features.

hismwi:

"HISMWI: MWI ON for station number (x)"
(Normal operation)
This data is logged after the following task communication completes. The task mwla requests hismwi to send a message waiting request for station number (x). The task hismwi in turn requests hissnd to send

out the specific message waiting packet. The task hissnd completes the packet transfer and replies to bismwi. At this time the CDR message is logged and hismwi replies to mwla.

"HISMWI: MWI off for station number (x)"
(Normal operation)
This data is logged after the following task communication completes. The task mwla request.3 hismwi to send a message waiting request for station number (x). The task hismwi in turn requests hissnd to send out the specific message waiting packet. The task hissnd completes the packet transfer and replies to hismwi. At this time the CDR message is logged and hismwi replies to mwla.

"HISMWI: Unable to locate hissnd"
(Internal error, may locate next transmission, else report condition)
This data is logged when hismwi needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. Each time data is received over the data link from the PMS system, hismwi retries to locate hissnd. If it is again unsuccessful, this message is again logged. When hissnd successfully restarts and attaches it's name, hisrcv and hismwi can locate it and link communication will proceed as expected.

"HISMWI: Unable to send to hissnd, data lost at level (x)"
"HISMWI: Unable to turn MWI (ON/off) for mailbox (x)"
(Internal. error, message lost, report condition)
This data is logged when hismwi needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. The data is lost and hismwi continues to run looking for further link data. The PMS system is probably not getting any data from hissnd and so it will consider the link down. When hissnd successfully restarts and attaches it's name, hisrcv and hismwi can locate it and link communication will proceed as expected. The level number is for engineering use to determine which one of three levels of sending the failure occurred. The second half of the message informs what mailbox was involved and if message waiting failed for an on or off attempt.

"HISMWI: Unable to locate mwla"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hismwi starts and it tries to locate the mwla task and fails.

"HISMWI: Unable to locate mwla in loop"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hismwi tries to send a response to the mwla at any time and fails.

hisresync:

"HISRESYNC: Resync message sent"
(Normal operation)
This data is logged when hisrcesync sends a resync message to the PMS system.

"HISRESYNC: Resync message failed"
(Internal error, report condition)
This data is logged when hisresync fails to send a resync message to the PMS system.

"HISRESYNC: Unable to locate hissnd"
(Internal error, report condition)

This data is logged when hisrcesync needs hissnd to send a resync message to the PMS system. The task hisresync returns to hisrcv without completing the command.

"HISRESYNC: Unable to send to hissnd, data lost"
(Internal error, message lost, report condition)
This data is logged when hisresync needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. The data is lost and hisresync returns to hisrcv without completing the command.

"HISRESYNC: Unable to re-send to hid, data lost"
(Internal error, message lost, report condition)
This data is logged when hisresync needs hissnd to send data allowing the link to stay active but the task hissnd can not be found by name. It tries to send once to hissnd and fails, then it is temporarily able to attach by name to hissnd again, tries to send a second time and fails. The data is lost and hisresync returns to hisrcv without completing the command.

hisinit:

"hisinit: Mailbox (x) MWI update"
(Normal operation)
This data is logged for each mailbox in the system that has a message waiting type #16 (HIS PMS). This is the result of a resync command sent from the PMS system.

"hisinit: Exit mailbox resynchronize loop"
(Normal operation)
This data is logged after all the mailboxes in the system have been scanned for the ones that have a message waiting type #16 (HIS PMS).

"hisinit: Unable to attach to HISINIT port"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisinit is started with a port number that can not be attached by this task.

"hisinit: Unable to locate mwla"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisinit tries to send a response to tbe mwla at any time and fails.

"hisinit: Unable to locate oaa"
(Internal error, report condition)
Error condition causes abort, error displayed on console and task restart
This data is logged when hisinit tries to send a response to the oaa at any time and fails.

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MITEL MAIL™

Voice Processing Solutions 1

TNPP Installation and Configuration

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Tefocator Network Paging Protocol (TNPP) installation and Configuration

INTRODUCTION

TNPP is a standard data communications protocol that is used for communications between paging terminals or other types of equipment required to implement a paging system network. The implementation of support for this protocol on VoiceMemo allows message waiting notification for mailboxes to be done by sending a TNPP page packet over a serial link to a Paging Terminal. The Paging Terminal delivers the page via the TNPP network. Mailboxes contain information about the individual pagers which is used in making the TNPP packet.

REQUIREMENTS

Software Reauirements

To support the TNPP Paging feature the following software must be installed:

- VoiceMemo Release 5.03 or later
- Extra-cost Feature diskette: Telocator Network Paging Protocol Release 5.03

Hardware Requirements

- At least one serial port on VoiceMemo per TNPP link (Smartcard ports are optional).
- An RS232 Cable connecting each link between VoiceMemo and a Paging Terminal.

LIMITATIONS

- If built-in serial ports are used ($term1 , $term2), the application must be configured on host 1.
- A maximum of ten TNPP links may be configured.

SOFTWARE CONFIGURATION

There are two areas of VoiceMemo that need configuration information for TNPP to operate. These areas are the Offline menu and Mailbox configuration.

The Offline Menu

To configure the Offline portion of TNPP, choose the RS232 or Smartcard Integrations selection from the Offline Menu. From the RS232 or Smartcard menu, choose the TNPP Paging option. This is the main configuration menu for TNPP. The first selection that must be made is to choose the host that the TNPP application will run on. If built in serial ports are used, the TNPP application must run on Host 1.

Offline Configuration Steps:

- Choose the VoiceMemo host that the TNPP application will run on
- Access the Pager Systems Menu and configure one or more pager systems for TNPP.
- Access the RS232 Link Menu and configure the serial link attributes
- Access the TNPP System Information Menu and configure the TNPP Network Information
- OPTIONAL: Access the TNPP Timing Parameters Menu to change any of the default timing parameters used by the TNPP protocol.
- Select the Verify TNPP Pager System Config option to check for any missing configuration information.
- Select the Display TNPP Pager System Config option to show the completed configuration information for active links.
- Exit the TNPP configuration, RS232 and Smartcard Integrations, and Offline menus. The data will not be save-d until the Offline Menu has been exited.

Offline Configuration Menu Parameters:

Host for TNPP

Enter the number of the host that the TNPP application will run on

Pager Systems Menu

Current Pager System

Select the number of the pager system to be configured or modified for TNPP.

Pager Name

Enter a name that will identify this pager system. This field is optional.

Show Pagers

This option will show all the pager systems that have been configured in the VoiceMemo system.

RS232 Link Menu

TNPP Link Number

Enter the TNPP link number to be configured

Active

Enter Y or N. TNPP tasks will only be started for links that are active. Enter Y to make this an active TNPP link.

Select Current Serial Port

Enter the name of a VoiceMemo serial port that will be used for this TNPP link. ($term1, $term2, $ctil...etc.)

Pager systems this link supports

Enter the pager system(s) that this TNPP link will support. The pager system can only support TNPP.

Baud rate

Enter the appropriate baud rate for the serial link. between VoiceMemo and the Paging Terminal. VoiceMemo's built in serial ports can be up to 1200 baud. Smartcard ports can be up to 9600 baud.

Number of data bits

This item has a default of 8 data bits which is standard for TNPP.

Number of stop bits

This item has a default of 1 stop bit which is standard for TNPP.

Parity

This item has a default of NONE which is standard for TNPP.

Display TNPP Serial Ports

Select this option to display the TNPP serial port information that is configured for each TNPP link.

Dispiay System Wide Serial Ports

Select this option to display the serial ports that are available on the VoiceMemo system and the applications that are using them.

TNPP System Information Menu

TNPP Link Number

Enter the TNPP link number to be configured

Source Address

Enter the TNPP network source address to be used by VoiceMemo.

Paging type

Enter either CAP or ID depending on which type of TNPP page packets will be sent to the Paging Terminal.

Inertia

Enter the inertia value for this TNPP serial link. This number represents the number of nodes that a packet may pass through before it is removed from the TNPP network.

System Message

Enter a system message. (Example: Call VoiceMemo). This message will appear on alpha-numeric pagers under certain circumstances. If a page is not a cut-through page and the mailbox does not have post-pager digits configured, the system message will be sent.

Display TNPP System Information

Select this option to display the TNPP System information that has been configured for each link.

TNPP Timing Parameters Menu

NOTE: The following parameter values represent the defaults recommended in the TNPP specification. No changes are necessary for a standard configuration.

TNPP Link Number

Enter the TNPP link number to be configured

Inter-char time within packet (tict)

This parameter represents the amount of time that VoiceMemo will wait between characters in a packet before generating a timeout. The name of the timeout event is tict. This applies to packets that are being received by VoiceMemo. Currently, the only packet that is received by VoiceMemo is a zero packet from the Paging Terminal.

Timeout on response with idle receiver (tnri)

This parameter represents the amount of time that VoiceMemo will wait for a response from the Paging Terminal when the VoiceMemo side of the link is idle. If the time expires, a tnri timeout will be generated. This timer is set after a packet is sent.

Timeout on response with busy receiver (tnrb)

This parameter represents the amount of time that VoiceMemo will wait for a response from the Paging Terminal when the VoiceMemo side of the link is busy. If the time expires, a tnrb timeout will be generated. This timer is set after a packet is sent.

Timeout on response to ENQ (tnre)

This parameter represents the amount of time that VoiceMemo will wait for a response from the Paging Terminal after VoiceMemo has sent an ENQ to the Paging Terminal. If the time expires, a tnre timeout will be generated.

RS flag hold off time (thold)

This parameter represents the amount of time that VoiceMemo will wait before re-sending a packet if an RS was received from the Paging Terminal after the packet was sent. When the timer expires, the packet will be sent again.

Timeout on idle link for keep alive ENQ (tidle)

This parameter represents the amount of time that a TNPP link can be idle before VoiceMemo will send an ENQ.

Number of retries by sending station per packet (Cretry)

This parameter represents how many times VoiceMemo will make on a packet that has been NAK'd.

Re-transmits in response to RS holdbacks (Chold)

This parameter represents the number of times that VoiceMemo will re-send a packet that an RS has been received on.

Number of ENQ retries before error logging (Cenq)

This parameter represents the number ENQ retries that VoiceMemo will make before it logs an error message. An ENQ retry occurs when VoiceMemo sends an ENQ and does not receive an EOT from the Paging Terminal. If the link goes down, an error message will be logged every 6 minutes.

Display TNPP Link Timing Parameters

Select this option to display the timing information that has been configured for each link.

Display TNPP Pager System Configuration

Select this option to display the TNPP configuration information for active links.

Verify TNPP Pager System Configuration

Select this option to check a TNPP link configuration for missing information. After this option is selected, enter the TNPP link number to be verified.

Mailbox Configuration

Mailbox configuration information for TNPP is entered after the message waiting type of Pager is selected and a pager access code index (the TNPP Pager system) is assigned to the mailbox. If the VoiceMemo system has the TNPP extra-cost feature enabled there is a prompt after the Pager system is assigned.

Mailbox Configuration Steps:

- Create a new mailbox or modify an existing one
- At the "Message waiting type?" prompt, enter 5 for Pager. Note that Message waiting type 1 or 2 may be used for TNPP Paging. Message waiting type 3 may NOT be used.
- At the "Pager access code index?" prompt, enter the TNPP pager system that was configured in the Offline TNPP configuration.
- For creating a mailbox or adding TNPP to an existing mailbox:

  At the "Configure TNPP fields?" prompt, enter y.

- For modifying a mailbox already configured for TNPP:
  At the "Modify TNPP fields?" prompt enter y.
- For deleting existing TNPP configuration information:
  At the "Delete TNPP fields?" prompt enter y.
- At the "TNPP CAP or ID paging:" prompt, enter either CAP or ID depending on what type of paging will be done for this mailbox.

Mailbox Parameters:

Message Waiting type #1 (or #2)
: Enter message waiting type 5 for Pager.

Pager Access Code Index
: Enter the TNPP Pager system index number that was configured in the Offline TNPP Pager system configuration menu: This is how the mailbox's page packet are directed to the correct TNPP serial link.

Configure TNPP fields?
: This prompt is displayed if the mailbox does not have any TNPP information configured. Answer Y to this prompt to configure the required TNPP information for this mailbox.

Delete TNPP fields?
: This prompt is displayed if the mailbox has TNPP information configured. Enter Y to clear the TNPP information and continue configuring a standard pager. Enter N or a carriage return to continue.

Modify TNPP fields?
: This prompt is displayed if the mailbox has TNPP information configured and the "Delete TNPP fields" prompt was not answered with Y. Enter Y to modify the existing TNPP information. Enter N or a carriage return to leave the TNPP information unchanged for this mailbox.

TNPP CAP or ID paging?
: Enter the type of paging packets that will be created for this mailbox. If the mailbox is CAP, the Pager system index for this mailbox (see above) must refer to the correct TNPP link that is doing CAP paging. The same holds true for ID paging. If the mailbox has ID paging, the pager system index must be supported by a TNPP link doing ID paging.

TNPP Destination Address
: Enter the four hexadecimal digit value that represents the address assigned to the message destination.

TNPP CAP code

This prompt is displayed if CAP paging was selected for this mailbox (see above). Enter the 8 characters that represent the CAP code of the mailbox owner's pager.

TNPP ID code

This prompt is displayed if ID paging was selected for this mailbox (see above). Enter the 10 characters that represent the customer ID to be paged.

TNPP Page type

This prompt is displayed if CAP paging was selected for this mailbox (see above). Enter the value that represents the signaling code scheme of the mailbox owner's pager. The help text for this item contains a list of supported values.

TNPP Page class

This prompt is displayed if CAP paging was selected for this mailbox (see above). Enter the value that represents the message encoding class of the mailbox owner's pager. The help text for this item contains a list of valid values.

TNPP RF Channel

This prompt is displayed if CAP paging was selected for this mailbox (see above). Enter the Radio Frequency channel designator for the mailbox owner's pager.

TNPP RF Zone

This prompt is displayed if CAP paging was selected for this mailbox (see above). Enter the Radio Frequency zone designator for the mailbox owner's pager.

TNPP Function Code

Enter the function code for the mailbox owner's pager.

Post-Pager number

The number entered here will be sent to the pager display if the page is not a Cut-Through page. If there are no Post-pager digits in the mailbox, the TNPP System message will be sent to the pager.

TESTING

Testing of TNPP Paging can be done after the Offline TNPP configuration has been completed and the configuration has been activated. Configure one or more test mailboxes for TNPP.

NOTE: If a TNPP page in is queue or in process for a mailbox, subsequent MWI ON requests for that mailbox will be ignored. If the frequency has not been exhausted or the message in the mailbox has not been deleted, the page will still be in queue. An MWI OFF must be sent to terminate the page that is in progress or in the queue. This can be done using the Lights Test utility or by deleting the message from the mailbox.

Use the lights test from the System Maintenance Menu, Additional Options selection. Send an "On" to the mailbox.

Result: The mailbox's pager should receive a page and continue receiving pages at the configured interval until the configured page frequency has been exhausted or an "Off' has been sent. The pager will display the Post-pager digits (if they were configured) or the System Message (if it was configured).

Leave messages for the mailbox

Result: The mailbox's pager should receive a page and continue receiving pages at the configured interval until the configured page frequency has been exhausted or the message has been played or deleted. The pager should display the Post-pager digits (if they were configured) or the System Message (if it was configured).

Leave a Cut-through page (If this Extra-cost feature is installed on the system)

Result: The mailbox's pager should receive a page and continue receiving pages at the configured interval until the configured page frequency has been exhausted or page notification has been played or deleted. The pager should display the Cut-Through page digits-

Leave a message in a mailbox with post-pager digits configured

Result: The mailbox's pager should receive a page and continue receiving pages at the configured interval until the configured page frequency has been exhausted, or the message has been played or deleted. The pager should display the Post-pager digits that were configured in the mailbox.

Leave a message in a mailbox with no post-pager digits

Result: The mailbox's pager should receive a page and continue receiving pages at the configured interval until the configured page frequency has been exhausted, or the message has been played or deleted. The pager should display the System Message that was configured in the TNPP System Information Menu in the Offline portion of the configuration.

TROUBLESHOOTING

There are several things to check if TNPP pages are not being delivered:

- Check both the Offline configuration data for TNPP and the mailbox's configuration for accuracy.

- Make sure the RS232 connection between VoiceMemo and the Paging Terminal is correct and that the link communication attributes are correct on each device. (baud rate, etc.)

- Check the logfile for any messages that could indicate the problem. For example, if a mailbox's pager system index refers to a TNPP link configured for CAP paging and the mailbox is configured for ID paging, an error message will be logged.

- Make sure that the pager information configured in the mailbox is consistent with the actual target pager.

- Check for any error messages on the Paging Terminal that mighf indicate what the problem is.

There are utilities available to aid in troubleshooting TNPP problems. The utility menu is accessed through the System maintenance menu by choosing Additional Options selection . From the Additional options menu choose the Utility Menu and then choose the TNPP Paging Utilities selection. These utilities are mainly intended for use by technicians or Centigram TAC for run-time troubleshooting. It is not necessary to access any of these menus if the TNPP application is working correctly. Each menu selection will prompt the user to enter a TNPP link number.

Link Utility Menu

Display link parameters
: This option will display the link number, host, port name, etc. that was configured for the link selected

Display link status
: This option will display the enabled status, link alive timer, etc. for the link selected.

Disable links
: This option will disable the TNPP link selected. The link will not process TNPP packets. The link will NOT remain disabled if the system reboots.

Enable links
: This option will re-enable a TNPP link that has been disabled with the Disable Links option.

Test links
: This utility can be used to send a Zero packet, ENQ, EOT, ACK, etc. on a TNPP link.

Configuration Adjustment Menu

NOTE: Configuration changes made here are run-time and will NOT be retained if the system reboots. Any permanent changes must be made in the Offline TNPP configuration menus.

Modify RS232 Link Menu

In this menu there are several RS232 Link attributes that can be changed during run-time. The items that can be modified are:

- Pager Systems Supported
- Number of data bits
- Number of stop bits
- Parity

After the item(s) to be changed have been selected, the Send changes to TNPPADMIN option must be selected to have the changes take effect.

Modify TNPP System Information Menu

In this menu the following items can be changed during run-time:

- Source Address
- Paging type (CAP or ID)
- Inertia
- System message

After the item(s) to be changed have been selected, the Send changes to TNPPADMIN option must be selected to have the changes take effect.

Modify TNPP Timing Parameters Menu

In this menu the following items can be changed during run-time:

- Inter-char time within packet (tict)
- Timeout on response with idle rcvr (tnri)
- Timeout on response with busy rcvr (tnrb)
- Timeout on response to ENQ (tnre)
- RS flag hold off time (thold)
- Timeout idle link for keep alive ENQ (tidle)
- Number of retries by sending station per pkt (Cretry)
- Re-transmits in response to RS holdbacks (Chold)
- Number of ENQ retries before error logging (Cenq)

After the item(s) to be changed have been selected, the Send changes to TNPPADMIN option must be selected to have the changes take effect.

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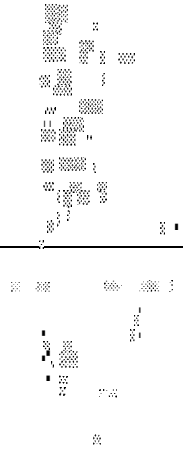
MITEL MAIL™

Voice Processing Solutions

PBX Integration

SX-200® DIGITAL PABX
SX-200 LIGHT PABX

MITEL®



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MITEL MAIL™ Enhanced In-Band Integration

(Software Rev. 6.0B) on

SX-200® DIGITAL and SX-200 LIGHT Systems

1. OVERVIEW

This document is intended to show the necessary hardware connectivity to the MITEL SX-200® DIGITAL PABX and the SX-200 LIGHT PABX, as well as to define the Customer Data Entry (CDE) requirements to integrate the MITEL MAIL™ Enhanced In-band application with the PBX.

2. GENERAL

Full integration between the *MITEL MAIL* system and the SX-200 is achieved through the use of the "Enhanced In-band" signaling application on *M/TEL MA/L,* and the Abbreviated Dialing and ONS Voice Mail features on SX-200 DIGITAL and SX-200 LIGHT systems.

Conditional Greetings can be enabled to provide Busy and No-Answer responses to callers forwarded to subscribers' mailboxes.

MITEL MAIL can be interfaced to the SX-200 without using the Enhanced In-band application, but is not discussed in this document. Mitel recommends the integration discussed in this document for ease of implementation, usability and increased functionality.

3. REQUIREMENTS/LIMITATIONS

- *MITEL MAIL* includes "Receptionist II" and "Enhanced In-band" as part of the basic package.
- Minimum software load of F41.0.2 is required to support the Enhanced In-band integration and use of SUPERSET™ Message key to retrieve messages.
- Illegal number is not supported. Callers are routed to the administrator's mailbox greeting (main greeting).
- ONS disconnect is not supported. Once the caller reaches the Receptionist II greeting, the call lasts for the entire greeting time.
- Message Waiting light must be turned off only via *M/TEL MAIL,* not by the PABX console operator, or the Cancel softkey on the telephone.
- Callers hear ringback while the digits are pulsed to the voice mail system. Audio is not cut through until after the last pause is executed.

4. HARDWARE INTERFACE

(Refer to Figure 1)

- The *MITEL MAIL* system interfaces to the *SX-200* family of PABXs via ONS lines.
- Receptionist II ports use shared ONS lines which are programmed in the same Hunt Group on the PABX.
- Message Waiting port(s) require a dedicated ONS line that is a member of a hunt group. This hunt group is NOT the same as VoiceMemo ONS lines hunt group.
- Pager Notification and FaxMemo also have separate line port(s).

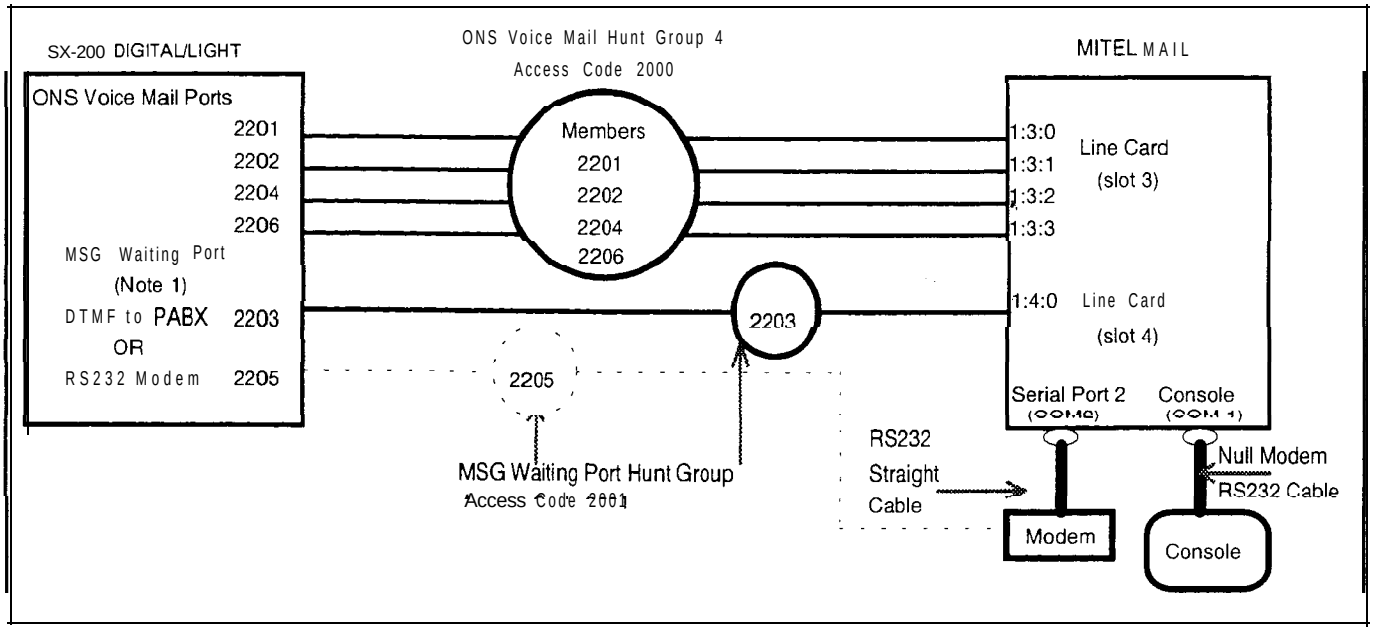


Figure 1 - SX-200 DIGITAL/LIGHT Interface with MITEL MAIL

NOTE: Message Waiting can be either a line card port or serial port; both options are shown in Figure 1.

5. SX-200 DIGITAL/LIGHT PROGRAMMING

A total of eight CDE forms must be accessed in order to program *MITEL MAIL* access on the SX-200:

- Form 01: System Configuration
- Form 02: Feature Access Codes
- Form 03: Class of Service
- Form 04: System Options
- Form 09: Station Programming
- Form 14: Non Dial-In Trunks
- Form 17: Hunt Groups
- Form 31: System Abbreviated Dial

5.1. System Configuration Form 1

- Program the ONS line cards in this form

5.2. Feature Access Codes Form 2

- Program a Feature Access code for Call Forwarding - Internal Only (Feature 4)
- Program a Feature Access code for Call Forwarding - External Only (Feature 5)
- Program a Feature Access code for Abbreviated Dial Access (Feature 24)
- Program a Feature Access code for Send Message (Feature 41)
- Program a Feature Access code for Call Message sender of Oldest Message (Feature 42)

5.3. Class of Service (COS) Form 3

- Voice mail lines and message sending line(s) should each be assigned a unique COS number. The following COS options should be enabled for each:

53.1. Voice Mail Port COS

- COS Option 212 (Can Flash if Talking to an Incoming Trunk)
- COS Option 213 (Can Flash if Talking to an Outgoing Trunk)
- COS Option 216 (Data Security)
- COS Option 238 (Override Security)
- COS Option 261 (ONS Voice Mail Port)

5.3.2. Message Waiting Port COS

- COS Option 216 (Data Security)
- COS Option 220 (Do Not Disturb)
- COS Option 235 (Originate Only)
- COS Option 238 (Override Security)
- COS Option 259 (Message Sending)
- COS Option 261 (ONS Voice Mail Port)
- COS Option 265 (Voice Mail System Speed Dial Index O-255)

NOTE: COS Option 265 must be set to the index number programmed in CDE form 31 for message retrieval (refer to Section 5.8.2 Message Retrieve Abbreviated Dial Number, on page 9).

5.3.3. User Extensions COS

- COS Option 206 (Call Forwarding - Busy)
- COS Option 207 (Call Forwarding - Don't Answer)
- COS Option 208 (Call Forwarding - External)
- COS Option 231 (Message Waiting Setup Bell) or COS Option 232 (Message Waiting Setup Lamp) in the COS of the mailbox holder's extension
- COS Option 245 (Abbreviated Dial Access)

5.4. System Options Form 4

- Enable System Option 21 (Incoming to Outgoing Call Forwarding)

5.5. Station Programming Form 9

- Program the ONS lines and give the appropriate COS
- Voice mail ports must be in a separate COS from the message waiting ports

5.6. Non Dial-h Trunks Form 14

- If required, enter the Voice Mail Port Hunt Group Access Code in form 14 for DAY, N1, and/or N2 for trunks to go to Receptionist

5.7. Hunt Groups Form 17

- Program all VoiceMemo ONS lines in a hunt group and give them a Hunt Group Access code.
- Program the Message Waiting line(s) in a hunt group and give them a Hunt Group Access code.

NOTE: Message Waiting Hunt Group is not the same as VoiceMemo ONS Hunt Group.

5.8. System Abbreviated Dial Form 31

Integration is based upon the use of system abbreviated dial numbers. This eliminates several dialing steps involved in sending and retrieving voice mail messages.

Special codes entered in the System Abbreviated Dial Form (CDE form 31) allow the caller to customize the PABX operation to suit the operation of the particular voice mail system.

The *MITEL MAIL* Enhanced In-band application, described in this document, is set up to expect three pieces of information, delimited by a # character. These digits are sent as DTMF tones by the PBX, after the voice mail port answers a call sent to it. The three fields expected are:

1) Reason call is forwarded to voice mail (i.e., Busy or No-Answer)

2) Called party's mailbox number

3) Calling party's mailbox number (if a system user)

All fields are provided by the insertion of special codes in the abbreviated dial String used to access MITEL MAIL.

The special codes include:

CODE	DESCRIPTION
*1	5-second pause
I 3xx	Insert manual dialed digits (XX represents digits expected)
*4	Send call forward condition to voice mail
*6	Tone out caller extension number
*8	Send digits of calling party to voice mail
*9	1 -second pause
**	DTMF digit *
o-9	DTMF digits 0 - 9

58.1. Message Forwarding Abbreviated Dial Number

Refer to Figure 2 - Call Forward and Message Retrieve Process. Users forward their sets to the index number. This must be set up as follows:

Index Number	Diait String
XXX	Voice Mail Hunt Group Access + *4 + # + *6 + # + *8 + #

Example: 100 = 2000*4#*6#*8#

Users' telephones are set up to forward calls, on Busy or No-Answer conditions, to this abbreviated dial number. If a call to a set is not answered, or encounters a busy condition, the PBX follows the forwarding that has been set, and dials the hunt group access code (2000 in this case).

When the *MITEL MAIL* system answers the forwarded call, the PBX sends the remaining digits (*4#*6#*8#).

The *4 is converted into the call forward Busy, or call forward No-Answer access code, defined in Form 4. This code is matched to a template in the Enhanced In-band programming so the appropriate greeting will play.

The *6 is converted into the calling party's extension number (i.e., the extension number of the telephone calling the *MITEL MA/L* system, which is also the user's mailbox number).

The I 8 is converted into the originator's extension number (i.e., the number of the extension that called the user's telephone), provided they are calling from another extension on the PBX. (NOTE: If the originator is an outside caller, the *8 code will not tone out any digits).

The # characters are toned out to mark the end of each field and are interpreted by *MITEL MAIL* as de-limiting characters.

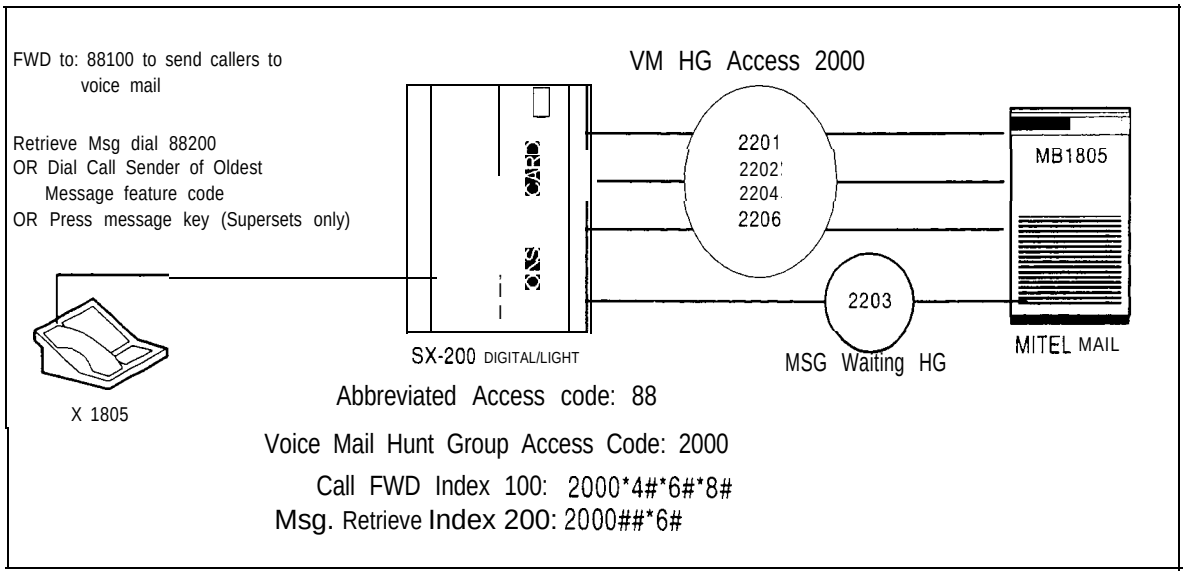


Figure 2 - Call Forward and Message Retrieve Process

5.8.2. Message Retrieve Abbreviated Dial Number

The index number for users to retrieve messages is set up as follows:

Index Number	Diait String
XXX	Voice Mail Hunt Group Access + # + # + *6 + #

Example: 200 = 2000##*6#

NOTE: This number is programmed as the index number for COS option 265 in the message waiting ports COS (refer to Section 5.3.2 Message Waiting Port COS on Page 5), and is used by the *SUPERSET* Message key and Call Message Sender of Oldest Message PBX features.

The PBX dials the hunt group access code (2000 in this case).

When *MITEL MA/L* answers the call, the PBX tones out the remainder of the abbreviated dial string (##*6#).

The *MITEL MA/L* system matches the ####to one of its programmed Enhanced In-band application templates, and the I 6 is converted into the calling party's extension number (i.e., the user's extension number, which is also the user's mailbox number).

The *MITEL MA/L* system plays the appropriate user login greeting and the user is prompted to enter a password.

5.9. Message Retrieval

Messages can be retrieved from the *MITEL MA/L* system by one of the following methods. Both methods assume that users are calling from their own extension telephones. The *MITEL MA/L* system prompts for users' passcodes before playing any saved messages.

5.9.1. Message Retrieval Using a *SUPERSET*

- SUPERSET 4®, SUPERSET 430™, and SUPERSET 4DN™:
  1. Press the Message softkey
  2. Press Read
  3. Press Call
- SUPERSET 420™:
  1. Press the Message key
  2. Press Call
- SUPERSET 41 0™:
  1. Press the Message key
- SUPERSET 401™:
  1. Go off-hook
  2. Press the Message key

5.9.2. Message Retrieval Using Feature Code

Go off-hook and dial the Call Sender of Oldest Message feature access code. This code is programed in Form 2 (Feature Access Codes), and is feature number 42.

5.9.3. Message Retrieval by Outside Caller

Although this section is not relevant to the PBX setup, it is included here for information purposes.

"Outside callers" refers to callers calling from outside the PBX, via trunk access. These callers are routed to the *MITEL MA/L* Receptionist II application, where they hear the "company greeting". Users who want to access their mailboxes from an extension other than their own, can do so by dialing the hunt group access code of the ONS voice mail ports. At this point they are treated in the same way as outside callers.

Outside callers who want to call into the *M/TEL MA/L* system to retrieve their messages, must press the * key (star) during the *M/TEL MAIL* company greeting. This puts them into the message centre application, where they are prompted for mailbox numbers. After entering mailbox numbers, they again press the * key (star) and are prompted for their passcodes. Once users successfully enter passcodes, they can retrieve their messages.

6. MITEL MAIL PROGRAMMING

The *MITEL MA/L* system must be programmed to integrate to the *SX-200* for proper call handling. The following programming details assist you to set up Enhanced In-band. Other basic programming, such as Message Waiting, is discussed in *MITEL MAIL Volume 2, Reference and Configuration.*

6.1. Step 1 • Define Line Group in Offline Menu

1. Log into the *M/TEL MA/L* system to access the OFFLINE Menu. The system displays the Main Menu:

```
MAIN MENU

(M) Mailbox maintenance
(C) CallAgent maintenance
(R) Report generation
(S) System maintenance
(X) Exit

If you need help later, type ?.

COMMAND (M/C/R/S/X):
```

⇒ Enter S to select System Maintenance. The system displays the System Maintenance menu:

```
SYSTEM MAINTENANCE

(A) Automatic Wakeup
(B) Automated Receptionist Extensions
(F) Floppy backup
(G) Resynchronize HIS PMS room status
(H) Hard Disk Utilities
(M) Manual Message Purge
(N) Site Name, Code, Banner
(0) Additional Options
(P) Passwords/Security
(R) Reconfiguration
(S) System shutdown
(T) Module Status
(U) System Verify
(V) Event Recorder
(W) Network menu
(X) Exit

If you need help later, type ?.

COMMAND (A/B/F/G/H/M/N/O/P/R/S/T/U/V/W/X):
```

⇒ Enter R to select Reconfiguration. The system displays the System Configuration menu:

```
SYSTEM CONFIGURATION

(A) Restore COS
(B) Backup COS
(C) Configure MWI suppression
(F) Feature COS
(G) Group COS
(L) Limits COS
(M) Restriction COS
(N) Network COS
(T) Tenant COS
(P) Phoneline exceptions
(R) Reconfigure system
(0) OneView Administration
(X) Exit

If you need help later, type ?.

COMMAND (A/B/C/F/G/L/M/N/T/P/R/O/X):
```

⇒ Enter **R** to select Reconfigure System. The system displays the VoiceMemo Configuration - Main Menu:

```
VOICEMEMO CONFIGURATION - MAIN MENU

(A)  Activate Configuration
(B)  Hardware Configuration
(C)  Increase System Hours
(D)  Define Floating Modules
(E)  Modify Active Configuration
(F)  Modify Inactive Configuration
(G)  Offline Menu
(H)  Configure Unified Integration
(X)  Exit

If you need help later, type ?.

COMMAND (A/B/C/D/E/F/G/H/X):
```

⇒ Enter **G** to select Offline Menu. The system displays the Offline Menu:

```
OFFLINE MENU: configuration 0.
Currently active configuration is: 1.

Reading configuration records...
Checking consistency between hardware configuration and OAA...

VoiceMemo Configuration - Offline Menu

(A)  Linegroup Only Applications
(L)  Linegroup and RS232 Applications
(M)  RS232 Only Applications
(E)  RS232 or Smartcard Integrations
(I)  Linegroup and Smartcard Integrations
(T)  DTMF to PBX Message Lights
(D)  Pre-Extension Dial Suing
(P)  SL-I Phone Emulator Menu
(F)  Serial Redirect Float Menu
(G)  Define Line Groups and Fax Groups
(N)  MESA-Net (Async and TCP/IP) Menu
(O)  CSOIO Integration Menu
(S)  Auto Gather - System Billing
(U)  Unified TCP/IP Menu
(Y)  Configure Smartcard Table
(C)  Report Current Configuration
(B)  Duplicate Active Configuration
(Q)  Quit -- Forget Changes
(X)  Exit -- Save Changes

OFFLINE MENU:
```

2. Enter B to select Duplicate Active Configuration.
   The system copies the active configuration into the inactive work area, then re-displays the Offline Menu in the abbreviated single line form:

```
Reading configuration records...
Checking consistency between hardware configuration and OAA
MKCONF: config I copied to config 0
OFFLINEMENU (A,L,M,E,I,T,D,P,F,G,N,O,S,U,Y,C,B,Q,X):
```

NOTE: To re-display any menu in its expanded form, press Enter key (carriage return) at the abbreviated menu prompt.

3. Enter G to select Define Line Groups and Fax Groups.
The system displays the Line Groups menu:

```
Line Groups
-----------
(G)  Current Group = [1]
(N)  Name of current group = []
(S)  Show ALL groups
(T)  Show THIS group
(U)  Show Unassigned lines
(A)  Add lines to current group
(D)  Drop lines from current group
(F)  Define Fax groups
(C)  Fax group connections for current line group
(X)  Exit
```

⇒ Enter G to select Current Group. The system prompts for a line group number. The [1] indicates group 1 is selected by default.
Enter the number for the line group you want to configure. (This example uses 3.)

```
Enter a Group number = [1] 3
```

⇒ The system responds as follows:

```
Group #3 has no lines assigned.
GROUP (G,N,S,T,U,A,D,F,C,X):
```

⇒ Enter N to select Enter group name. Enter the name you choose for this group. (This example uses Enhanced in-band):

```
Enter group name = [] Enhanced /n-band
GROUP (G,N,S,T,U,A,D,F,C,X):
```

⇒ Enter A to add lines to this group. Lines are added by entering their triplet identifiers (Module:Slot:Circuit). Enter a ? at the prompt for detailed command help.

```
Enterlinestoadd- 1:3:0,1:3:1
GROUP (G,N,S,T,U,A,D,F,C,X):
```

⇒ Enter T to Show This group. Confirm the lines you added appear:

```
Group #3: "Enhanced In-band"
 Module 1: Lines 3:0 3:1
       Fax Conn: <none>
GROUP (G,N,S,T,U,A,D,F,C,X):
```

⇒ Enter X to exit the Line Groups menu and return to the Offline Menu.

4. Enter A to select the Linegroup Only Applications menu:

```
Group #3 lines = [VOICEMEMO]

Linegroup Only Applications
---------------------------
(G)  Group selected = [3]
(U)  User Interface = []
(D)  DID VoiceMemo
(E)  Enhanced Inband
(P)  Pager
(R)  Receptionist
(V)  VoiceMemo
(S)  Special VMVG Application
(W)  Disable
(X)  Exit
```

5. Enter E to select the Enhanced In-band application for this line group:

```
Group #3 lines = [ENHANCED IN-BAND]

INBAND Integration

(A)  Calling Extension Absorbed Digits (O-12) = []
(B)  Calling Extension Signed Offset (+/-N) = []
(C)  Called Extension Absorbed Digits (O-12) = []
(D)  Called Extension Signed Offset (+/-N) = []
(E)  MF Enable? (Y/N) = [N]
(X)  Exit
```

⇒ No changes are required to this application.
Enter X to return to the Linegroup Only Applications menu:

```
Group #3 lines = [ENHANCED IN-BAND]
APPL (G,U,D,E,P,R,V,S,W,X):
```

⇒ Enter X to return to the Offline Menu.

6. Enter X to Exit and Save Changes. The system writes the changes to the offline configuration and returns to the VoiceMemo Configuration - Main Menu:

```
Writing new configuration report to /usr/vm/config/vm.report.0...
Writing new configuration commands to /usr/vm/config/vm.cmd.0...
TCPIP: writing /usr/vm/config/tcp.init.0 . . . .
TCPIP: writing /usr/vm/config/tcp.host.0 . . . .
WARNING: ACTIVATE CONFIGURATION to enable changes!

COMMAND (A/B/C/D/E/F/G/H/X):
```

7. Enter A to select VoiceMemo Active Configuration Menu:

```
VOICEMEMO ACTIVE CONFIGURATION MENU

(A)  Activate Configuration
(N)  Name Configurations
(V)  View Configurations
(X)  Exit

If you need help later, type ?.

COMMAND (A/NIV/X):
```

⇒ Enter A to activate the inactive configuration:

```
Configuration last edited by OFFLINE CONFIGURATION is 0.

CONFIG NUMBER   NAME              ACTIVE   DATE       ACTIVATION DATE
 00   CONFIGURATION # 0          NO       04/24/96 15: 17
 01   CONFIGURATION # 1          YES      04/18/96 14:05 04118196 14:06

Activate inactive configuration, 'CONFIGURATION # O'? [Y/N]: Y
```

⇒ Enter Y to activate:

```
Line states (A-active, I-idle, S-stopped) for module I (slot:port)
3:o = I 3:1 = I 3:2 = I

Message Indicator Request Queue Lengths
active:0  untried:0  retrying:0  calls  expected:0

Paging Request Queue Lengths
active:0  untried:0  retrying:0  calls expected.0

Wait for message waiting queues to be empty? [Y]:   (Press Enter key here)
```

```
Wait for paging queues to be empty? [Y]:                    (Press Enter key here)
Line states (A-active, I-idle, S-stopped) for module 1 (slot:port)
3:0 - S 3:1 - S 3:2 - I

Message Indicator Request Queue Lengths
active:0    untried:0   retrying:0   calls   expected:0

Paging Request Queue Lengths
active:0    untried:0   retrying:0   calls   expected:0

**** SHUTDOWN COMPLETE ****
cp: Copying /usr/vm/config/tcp.init to /usr/vm/config/tcp.init.old
cp: Copying /usr/vm/config/tcp.init.0 to /usr/vm/config/tcp.init
cp: Copying /usr/vm/config/tcp.host to /usr/vm/config/tcp.host.old
cp: Copying /usr/vm/config/tcp.host.0 to /usr/vm/config/tcp.host
Master configuration record updated, restarting tasks
.
. . . . (.... system restart messages not shown . ...)
.....
```

⇒ Wait for the system to restart and display Program Initialization Complete:

```
<*******************************>
 Program Initialization Complete
<*******************************>
```

(Press Enter key here, to ***re-display VoiceMemo*** *Active Configuration Menu)*

```
VOICEMEMO ACTIVE CONFIGURATION MENU

(A)  Activate Configuration
(N)  Name Configurations
(V)  View Configurations
(X)  Exit

If you need help later, type ?.

COMMAND (A/N/V/X):
```

⇒ Enter X to return to the VoiceMemo Configuration - Main Menu:

```
COMMAND (A/B/C/D/E/F/G/H/X):                    (remember, press Enter to expand any menu)

VOICEMEMO CONFIGURATION MAIN MENU

(A)  Activate Configuration
(B)  Hardware Configuration
(C)  Increase System Hours
(D)  Define Floating Modules
(E)  Modify Active Configuration
(F)  Modify Inactive Configuration
(G)  Offline Menu
(H)  Configure Unified Integration
(X)  Exit

If you need help later, type ?.

COMMAND (A/B/C/D/E/F/G/H/X):
```

6.2. Step 2 - Configure the Enhanced In-Band Application

After the line group is set to run the Enhanced in-band application, configuration is required for the application to work correctly.

The previous steps left the system at the VoiceMemo Configuration - Main Menu prompt. (Enter S-R-R from the Main Menu.)

```
VOICEMEMO CONFIGURATION - MAIN MENU

(A)  Activate Configuration
(B)  Hardware Configuration
(C)  Increase System Hours
(D)  Define Floating Modules
(E)  Modify Active Configuration
(F)  Modify Inactive Configuration
(G)  Offline Menu
(H)  Configure Unified Integration
(X)  Exit

If you need help iater. type ?.

COMMAND (A/B/C/D/E/F/G/H/X):
```

1. Enter E to select Modify Active Configuration. The system displays:

```
ONLINE MENU: operating on configuration number 0.
Currently active configuration number is: 0.

Configuration last edited by OFFLINE MENU is 0.
MKCONF2: confignum is 0, vmreport string: /usr/vm/config/vm.report.0

Enter "?<RETURN>" at any time for help.

Group #1 lines - [VOICEMEMO]

VoiceMemo Configuration Online Menu

(G)  Group selected = [1]
(M)  Modify Application
(C)  Report Current Configuration
(Q)  Quit -- Forget Changes
(X)  Exit -- Save Changes

ONLINE MENU:
```

⇒ Enter G to select the group number to configure.

```
Enter a Group number - [I] 3
```

⇒ Enter the number of the Enhanced In-band line group (3 in this example).

⇒ Enter M to Select the Modify Group menu option:

```
ENHANCED IN-BAND
----------------------------
(A)  Configure Application
(B)  Other Features
(X)  Exit
```

2. Enter A to select Configure Application. The system displays the Enhanced In-band menu:

```
ENHANCED IN-BAND

(N)  Application Name = []
(D)  Application Description = []
(T)  Edit Templates Menu
(P)  Edit Parameters Menu
(O)  Show Application
(I)  Install Application
(L)  List Applications
(S)  Save Application
(X)  Exit
```

⇒ Enter N to select Application Name. This name will be used to install the application later in this procedure (refer to page 23).

```
Application Name = [] EIB-200D
```

⇒ Enter an Application Name (EIB-200D in this example).

⇒ Enter D to select Application Description:

```
Application Description = [] MITEL ENHANCED INTEGRATION
```

⇒ Enter an application description (MITEL ENHANCED INTEGRATION in this example)

3. Enter T to select the Edit Template Menu:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [1]
(D)  Data = []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  Exit

EDIT TEMPLATE MENU:
Current Template = [1]                    (Template 1 Is selected by default)
```

⇒ Templates are used to match codes sent by the PBX. Seven templates are required for this application. Enter the following information for Template 1:

```
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): D
Data- [] R
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action = [] T
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): N
Next Templates = [] 2 3 4 5 6 7
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] Answer call and run templates 2,3,4,5,6 and 7
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 1, and check that the information you entered is correct:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [1]
(D)  Data = [R]
(A)  Action = [T]
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = [2 3 4 5 6 7]
(C)  Comment = [Answer call and run templates 2,3,4,5,6 and 7]
(X)  Exit

EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
Current Template = [1]
```

⇒ Enter M to select Modify Template option.
Enter 2 to select template 2:

```
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):          (Press Enter key to expand menu)
```

⇒ Press Enter to display Template 2 in its expanded form.

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [2]
(D)  Data = []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  Exit
```

4. Enter the following information for Template 2:

```
EDIT TEMPLATE MENU: D
Data = [] 632#dx#sx#
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action = [] V4
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): T
Timeout = [] 10
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): E
Error Action = [] H
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] Call Forward Busy (External)
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 2 and check that the information you entered is correct:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [2]
(D)  Data = [632#dx#sx#]
(A)  Action = [V4]
(T)  Timeout = [10]
(E)  Error Action = [H]
(N)  Next Templates = []
(C)  Comment = [Call Forward Busy (External)]
(X)  Exit

EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
Current Template = [1]
```

⇒ Enter M to select Modify Template option.
Enter 3 to select template 3:

```
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):          (Press Enter key to expand menu)
```

⇒ Press Enter to display Template 3 in its expanded form:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [3]
(D)  Data = []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  Exit
```

5. Enter the following information for Template 3:

```
EDIT TEMPLATE MENU: D
Data = [] 622#dx#sx#
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action = [] V4
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): T
Timeout = [] 10
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): E
Error Action = [] H
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] Call Forward Busy (Internal)
EDIT TEMPLATE! MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 3 and check that the information you entered is correct:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [3]
(D)  Data = [622#dx#sx#]
(A)  Action = [V4]
(T)  Timeout = [10]
(E)  Error Action = [H]
(N)  Next Templates = []
(C)  Comment = [Call Forward Busy (Internal)]
(X)  Exit

EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
Current Template = [1]
```

⇒ Enter M to select Modify Template option.
Enter 4 to select template 4:

```
EDITTEMPLATE MENU (M,D,A,T,E,N,C,X):          (Press Enter key to expand menu)
```

⇒ Press Enter to display Template 4 in its expanded form:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [4]
(D)  Data = []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  Exit
```

6. Enter the following information for Template 4:

```
EDIT TEMPLATE MENU: D
Data = [] 633#dx#sx#
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action = [] V3
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): T
Timeout- [] 10
EDITTEMPLATE MENU (M,D,A,T,E,N,C,X): E
Error Action- [] H
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] Call Forward No-Answer (External)
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 4 and check that the information you entered is correct:

```
IN-BAND EDITTEMPLATE Menu
-------------------------------------
(M)  Modify Template = [4]
(D)  Data = [633#dx#sx#]
(A)  Action = [V3]
(T)  Timeout = [10]
(E)  Error Action = [H]
(N)  Next Templates = []
(C)  Comment = [Call Forward No-Answer (External)]
(X)  Exit

EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
Current Template = [1]
```

⇒ Enter M to select Modify Template option.
Enter 5 to select template 5:

```
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):          (Press Enter key to expand menu)
```

⇒ Press Enter to display Template 5 in its expanded form.

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [5]
(D)  Data- []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  Exit
```

7. Enter the following information for Template 5:

```
EDIT TEMPLATE MENU: D
Data- [] 623#dx#sx#
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action = [] V3
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): T
Timeout- [] 10
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): E
Error Action = [] H
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] Call Forward No-Answer (Internal)
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 5 and check that the information you entered is correct:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [5]
(D)  Data = [623#dx#sx#]
(A)  Action = [V3]
(T)  Timeout = [10]
(E)  Error Action = [H]
(N)  Next Templates = []
(C)  Comment = [Call Forward No-Answer (External)]
(X)  Exit

EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
Current Template = [I]
```

⇒ Enter M to select Modify Template option.
Enter 6 to select template 6:

```
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):          (Press Enter key to expand menu)
```

⇒ Press Enter to display Template 6 in its expanded form:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [6]
(D)  Data = []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  Exit
```

8. Enter the following information for Template 6:

```
EDIT TEMPLATE MENU: D
Data = [] ##sx#
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action = [] V1
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): T
Timeout = [] 10
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): E
Error Action = [] H
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] Local Login
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 6 and check that the information you entered is correct:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [6]
(D)  Data = [##sx#]
(A)  Action = [VI]
(T)  Timeout = [10]
(E)  Error Action = [H]
(N)  Next Templates = []
(C)  Comment- [Local Login]
(X)  Exit

EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
Current Template = [ ]]
```

⇒ Enter M to select Modify Template option.
Enter 7 to select template 7:

```
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):          (Press Enter key to expand menu)
```

⇒ Press Enter to display Template 7 in its expanded form:

```
IN-BAND EDIT TEMPLATE Menu

(M)  Modify Template = [7]
(D)  Data = []
(A)  Action = []
(T)  Timeout = []
(E)  Error Action = []
(N)  Next Templates = []
(C)  Comment = []
(X)  E x i t
```

9. Enter the following information for Template 7:

```
EDIT TEMPLATE MENU: D
Data = [] ###
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): A
Action- [] V
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): T
Timeout = [] 10
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): E
Error Action = [] V5
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X): C
Comment = [] A uto A ttendant (Receptionist II)
EDIT TEMPLATE MENU (M,D,A,T,E,N,C,X):
```

⇒ Press Enter to re-display Template 7 and check that the information you entered is correct:

```
IN-BAND EDIT TEMPLATE Menu
--------------------------------------------------
(M)  Modify Template = [7]
(D)  Data = [###]
(A)  Action = [V5]
(T)  Timeout = [10]
(E)  Error Action = [V5]
(N)  Next Templates = []
(C)  Comment = [Auto Attendant (Receptionist II)]
(X)  E x i t

EDIT TEMPLATE MENU:
```

⇒ Enter X to Exit from templates menu.

⇒ Press Enter to display Enhanced In-band menu in its expanded form:

```
ENHANCED  IN-BAND

   Date Installed: Mon Feb 5 12:36: 12 1996

   Date Modified : Wed Apr 24 15:22:46 1996

(N)  Application Name = [EIB-200D]
(D)  Application Description = [MITEL ENHANCED INTEGRATION]
(T)  Edit Templates Menu
(P)  Edit Parameters Menu
(O)  Show  Application
(I)  Install Application
(L)  List Applications
(S)  Save Application
(X)  Exit
```

10. Enter 0 to Show Application. Ensure that all Templates are set up correctly:

```
NAME: EIB-200D
DESCRIPTION: MITEL ENHANCED INTEGRATION
Installation Date: Mon Feb 5 12:36: 12 1996

Last Modify Date: Wed Apr 24 15:22:46 1996

  Tl: R, T, ,
 Next: 2 3 4 5 6 7
Comment: Answer call and run templates 2.3.4.5.6 and 7

  T2: 622#dx#sx#, V4, 10, H
 Next:
Comment: Call Forward Busy (External)

  T3: 622#dx#sx#, V3, 10. H
 Next:
Comment: Call Forward Busy (Internal)

  T4: 633#dx#sx#, V3. 10, H
 Next:
Comment: Call Forward No-Answer (External)

  T5: 623#dx#sx#, V3, 10. H
 Next:
Comment: Call Forward No Answer (Internal)

  T6: ##sx#, VI, IO, H
 Next:
Comment: Local Login

  T7: ###, V5, 10, v5
 Next:
Comment: Auto Attendant (Receptionist 11)

IN-BAND MENU (N,D,T,P,O,I,L,S,X):
```

6.3. Step 3 ▪ install the Enhanced In-Band Application

After the templates are defined and entered, the application must be installed.

⇒ Press Enter to display Enhanced In-band menu in its expanded form:

```
ENHANCED IN-BAND

  Date Installed: Mon Feb 5 12:36: 12 1996

  Date Modified : Wed Apr 24 15:22:46 1996

(N) Application Name ▪ [EIB-200D]
(D) Application Description ▪ [MITEL ENHANCED INTEGRATION]
(T) Edit Templates Menu
(P) Edit Parameters Menu
(O) Show Application
(I) Install Application
(L) List Applications
(S) Save Application
(X) Exit

IN-BAND MENU:
```

1. Enter I to select Install Application:

Application name to install = **EIB-200D**

⇒ Enter the Application Name.
The name is case sensitive and must be entered exactly as it appears in the application name field.
In this example, the name is **EIB-200D** (refer to page 17).

2. Enter S to save application. The system prompts for the following:

Do you want to overwrite existing copy? (YIN): **Y**

⇒ Enter Y to confirm the overwrite:

Application saved.
IN-BAND MENU (N,D,T,P,O,I,L,S,X):

3. Enter X to Exit and return to the In-band menu.

6.4. Step 4 - Set Additional In-Band Features (Receptionist II)

The previous steps installed the Enhanced In-band application. Additional features for the application must now be set up.

IN-BAND MENU (A,B,X): *(Press Enter key to expand menu)*

ENHANCED IN-BAND

(A) Configure Application
(B) Other Features
(X) Exit

1. Enter B to select Other Features from the Enhanced In-Band menu:

Group #3 lines = [ENHANCED IN-BAND]

INBAND Application

(I) Enable Receptionist (y/n) = [N]
(N) Day/Night
(D) Dialing Plan Menu
(Z) Dial String and Mailbox Menu
(K) KEY-O for attendant transfer during greeting (y/n) = [NJ
(W) Prompts "Enter mailbox # or wait" (y/n) = [Y]
(M) Allow multiple messages for outside caller (y/n) = [Y]
(L) Default prompt language = [English]
(E) Delay Before Answer (.01 sec increments) = [SO]
(F) Dial-by-Name Menu
(P) Passcode Menu
(O) OneCall Menu
(A) Allow Dial an Extension Menu
(Q) Speech Quality Menu
(R) Receptionist Menu
(S) Analog Networking Configuration Menu
(B) Mailbox On Demand Menu
(X) Exit

2. Enter I to select Enable Receptionist from the In-band Menu:

Receptionist Enabled? (y/n) = [N] **Y**

⇒ Enter Y to enable to enable Receptionist.

3. Enter N to select Day/Night Menu:

```
Day/Night Menu
--------------------
(S)  Start time of the workday (hh:mm [am/pm]) [08:00 AM]
(E)  End time of the workday (hh:mm [am/pm]) [05:00 PM]
(W) Weekend Days (Monday thru Sunday) [DN]  [DDDDDNN]
(X)  Exit
```

⇒ Make any required changes from the default settings. Enter X to Exit back to the In-band Application menu.

4. Enter D to select Dialing Plan Menu:

```
Dialing Plan
---------------
(D) Dialing plan = [3,3,3,3,3,3,3,3,3]
(E) Optional Star Prefix Dplan
(X) Exit
```

⇒ Make any required changes from the default settings. Enter X to Exit back to the In-band Application menu.

5. Enter Z to select Dial String and Mailbox Menu:

```
Dial String and Mailbox Menu
-----------------------------------
(A)  System Attendant's extension = [0]
(B)  Attendant's transfer string = [S+]
(C)  Administrator's mailbox # = [998]
(D)  Attendant's mailbox # = [999]
(E)  E-mail transfer string = []
(G)  General Greeting mailbox # = []
(H)  Disconnect String = []
(P)  Pre-company name dial string = []
(M)  he-mailbox greeting dial string = []
(X)  Exit
```

⇒ Make any required changes from the default settings. Enter X to Exit back to the In-band Application menu.

6. Enter K to select KEY-O for attendant transfer during greeting (y/n) prompt:

```
KEY-O for attendant transfer during greeting (y/n) = [N] Y
```

⇒ Enter Y to allow Key 0 attendant transfer.

7. Enter F to select the Dial By Name menu:

```
Dial By Name
--------------------
(L)  Last Name First flag = [Y]
(N)  Number of names threshold = [3]
(E)  Exact Match Break = [Y]
(S)  Single Digit Access = [N]
(M)  Suppress Mailbox Number = [N]
(X)  E x i t
```

⇒ Make any required changes from the default settings. Enter X to Exit back to the In-band Application menu.

8. Enter P to select the Passcode Menu:

```
Passcode Menu
-------------
(M)  Minimum Passcode Length = [4]
(N)  Maximum Passcode Length = [10]
(C)  Passcode Trip Count = [5]
(P)  Passcode Trip Period = [24]
(X)  Exit
```

⇒ Make any required changes from the default settings. Enter X to Exit back to the in-band Application menu.

9. Enter R to select the Receptionist menu:

```
Receptionist
------------
(D)  Dialing Plan Options
(F)  Flow Options
(P)  PBX Dial String Definitions
(T)  Trunk /Extension Treatment Types
(X)  Exit
```

10. Enter D to select the Dialing Plan Options:

```
Dialing Plan Options
--------------------
(P)  Dialing Plan = [3,3,3,3,3,3,3,0,0]
(D)  Delete Digits = [0,0,0,0,0,0,0,0,0]
(F)  Offset Table
(T)  Timeout for Receipt of First Digit (.1 seconds) = [0]
(Y)  PBX Console Attendant Day Access Code = [OH]
(Z)  PBX Console Attendant Night Access Code = [OH]
(X)  Exit
```

⇒ Make any required changes from the default settings. Enter X to Exit back to the Receptionist menu.

11. Enter P to select the PBX Dial String Definitions menu:

```
PBX Dial String Definitions
---------------------------
(Z)  Default Options Menu
(A)  Rolm CBX
(B)  Northern Telecom SL-I
(C)  AT&T Dimension
(D)  Mitel SX
(E)  AT&T System 75/85
(F)  NEC 2400
( G )  Centrex
(H)  Fujitsu Focus
(I)  Hitachi DX
(J)  Telexicom 1001
(K)  Siemens Saturn
(X)  Exit
```

12. Enter **Z** to select the Default Options Menu:

Default PBX Options Menu

(A) Post Directory number dial string [+]
(B) Pre Directory number dial string / Attendant xfer string [S+]
(C) Connect Dial string on Called Party Accept []
(E) Dial string for Return on Called Party Refused [++]
(F) Dial string for Return on Called Party Busy [S+]
(G) Special actions on Reorder Tone Encountered [OH]
(H) Dial string for Return on Called Party RNA [S+]
(X) Exit

13. Enter A to select the Post Directory number dial string option. Set to +H:

Post Directory number dial string [+] +H

NOTE: The Post DN must be set to +H or left blank. If it is set to +H (the Mitel preferred setting), *M/TEL MA/L* performs a blind transfer and options C, E, F, G, H are ignored. If this setting is left blank, *M/TEL MA/L* performs a screened transfer. To leave blank, enter . (a period) and press Enter.

DEFAULT (A,B,C,E,F,G,H,X): *(Press Enter key to expand menu to check changes)*
Default PBX Options Menu

(A) Post Directory number dial string [+H]
(B) Pre Directory number dial string / Attendant xfer string [S+]
(C) Connect Dial string on Called Party Accept []
(E) Dial string for Return on Called Party Refused [++]
(F) Dial string for Return on Called Party Busy [S+]
(G) Special actions on Reorder Tone Encountered [OH]
(H) Dial sting for Return on Called Party RNA [S+]
(X) Exit

⇒ Enter X to return to the PBX menu.

⇒ Enter X to return to the Receptionist menu.

⇒ Enter X to return to the In-band Application menu,

⇒ Enter X to return to the In-Band Menu:

IN-BAND MENU (A,B,X):

ENHANCED IN-BAND

(A) Configure Application
(B) Other Features
(X) Exit

⇒ Enter X to return to the VoiceMemo Configuration - Online Menu:

VoiceMemo Configuration -Online Menu

(G) Group selected = [3]
(M) Modify Application
(C) Report Current Configuration
(Q) Quit -- Forget Changes
(X) Exit -- Save Changes

14. Enter X to save changes and return to the VoiceMemo Configuration - Main Menu:

```
Writing new configuration report to /usr/vm/config/vm.report.0
vmcmd_update: performing 'cp /usr/vm/config/vm.report.0 /usr/vm/config/vm.report
```

15. Enter X three additional times to exit back to the Main Menu.

```
COMMAND (M/C/R/S/X):                    (Press Enter key to expand menu)
(c) All Software Copyright 1983, 1995 Centigram Comm. Corp. All Rights Reserved.
            <System Status>
 HOST:    I
STATUS:  ENA
OS VSN :  4.22C
MEMORY : 04860/ 16000
LOG  DATA:  Y

          Disk0  Disk 1  Disk 2  Disk 3
 Bus 0:   ENA    ENA     -       -

  MAIN MENU

(M)  Mailbox  maintenance
(C)  CallAgent  maintenance
(R)  Report  generation
(S)  System  maintenance
(X)  Exit
```

16. Enter **R** to select report generation, and check the setup:

```
  REPORTS

(B)  Billing
(C)  Configuration
(D)  Pre-extension  dial  strings
(E)  L C O S
(F)  FCOS
(G)  G C O S
(H)  NCOS
(I)  System information
(J)  Phonebook Report
(K)  Redundancy Verify Report
(L)  Log  tile
(M)  Mailbox  data
(P)  Phoneline  exceptions
(R)  Pager access codes
(S)  Statistics
(T)  Receptionist  treatments
(V)  Offline  Verify
(X)  Exit
```

⇒ Enter C to select the Configuration Report:

```
  REPORT OUTPUT ROUTING

(C)  Console  (screen)
(P)  Console with pause
(1)  Serial Port 1
(2)  Serial  Port  2
(F)  File...
(A)  Append  to  file...
(X)  Exit (no report)
```

⇒ Enter C to select Console for output (or 2 if a printer is attached to serial port 2).

⇒ Enter the number of the group to display (3 in this example):

```
Enter Group Number to Display (i-24) or <CR> for all: 3

                    SYSTEM CONFIGURATION
                    Fri Apr 26 13:46:24 1996


Group #3: "Enhanced In-Band "
Lines 3:0 3: 1
 Application = [ENHANCED IN-BAND]
 Dial plan = [3,3,3,3,3,3,3,3,3,3]
 Administrator mbox # = [998]
 General Greeting mbox # = []
 Attendant mbox # = [999]
 Wait Prompt = [Y]
 Caller multiple messages enabled = [Y]
 KEY-O for attendant transfer during greeting = [N]
 Disconnect string = []
 Pre-company name string = []
 Pre-mailbox greeting string = []
 Passcode Length Min = [4], Max = [10], Language = [English]
 Start of day = [08:00 AM], End of day = [05:00 PM], Days of Week = [DDDDDNN]
 Passcode trip count = [5], Passcode trip period = [24]
 Dial-by-name: Last First = [Y], Match Threshold = [3], Exact = [Y]
          Suppress Number = [N], Single Digit Access = [N]
 Delay Before Answer = [50]
 E-mail Transfer String = []
 Allow Dial an Extension for callers = [N], users = [N]
 Analog Networking: Call Setup timeout = [6]
   International Access Code = [], Country code = []
   Area/City code = [], 1plus dialing = []
   Area/City code is dialed with Local Telephone Number = [N]
   Telephone number = [], Loop-back Test Mailbox = []
 Name Greet Quality = [], Message Quality = []
 Receptionist Enabled = [N]
 Pre DN or attendant xfer string = [S+]
 Attendant's extension = [0]
NAME: EIB-2COD
DESCRIPTION: MITEL ENHANCED INTEGRATION
Installation Date: Fri Apr 26 I 1:49:58 1996
Last Modify Date: Fri Apr 26 13:35:53 1996
Calling Extension Absorbed Digits:
Calling Extension Signed Offset:
Called Extension Absorbed Digits:
Called Extension Signed Offset:
MF Detection Enabled = N

Pager Systems:
 Pager System [0], Pager Name = "internal"
  Access code = [t], Hold time = [20]
 Pager System [1], Pager Name = "billed"
  Access code = [T9T0], Hold time = [20]
 Pager System [2], Pager Name = "UNBILLED"
  Access code = [T9], Hold time = [20]

Port $term2 RS-232 Serial Port application = [Programmable]
 Programmed values for Port $term2:
  Initialization string = [], Reply string = []
  Pre-DN ON string = [atdt76], Pre-DN OFF string = [atdt7*]
  Post-DN ON string = [\r], Post-DN OFF string = [\r]
  Dept Code as DN = [], Unplayed msg count sent = []
  Delay between message waiting requests = [5]
  Delay between Post-DN and Trailer string = [5]
  Trailer string = [+++ATH\r]
  Suppress message light updates = [y]
  [Basic Network configuration info]
      Local Network Node = [I]
      Links installed = [2]
      Network (host:link:answer/originate mode) =
```

```
TCP/IP System Wide Host Configuration

        Domain name: software
H C M S
o a o l N
s r d o e
t d e t t    IP Address      Host Name     Port Irq Vendor

1 l P 1 3  134.199.54.147      oneview 0280  10  ALTA #1
ost Card      Gateway Address    Subnet Mask  Broadcast Address

 l   l       134.199.54.25  I  255.255.255.0     134.199.54.255

 SMARTCARD TABLE
host  card  port-name  cpu        owner              intr addr

The following optional features are enabled:
 Analog Networking
 Receptionist
 Networking
 FaxMemo
 Enhanced In-band
 TCP/IP
 OneView
 Call Agent
 Disk Redundancy

 Prompt Language Configuration:
 English

END
Press any key to continue....
```

17. Enter X two times to return to the Main Menu.

⇒ Check the report to ensure that the line group is programmed correctly.

This completes the Enhanced In-Band programming. Mailboxes for all users must now be created on the *MITEL MAIL* system. If conditional greetings are to be used, ensure that FCOS given to mailboxes include feature bit number 161 (Conditional Greetings).

6.5. Test the Application

1. Set up a telephone to call forward on Busy, or No-Answer, to the abbreviated number chosen to send callers to voice mail.
   (Refer to Section 5.8.1 Message Forwarding Abbreviated Dial Number, on page 8).

2. Call the telephone and let it ring No-Answer.

⇒ Check that the call goes to voice mail and the correct No-Answer greeting plays.

3. Take the telephone off-hook to put it in Busy condition, and call it again

⇒ Check that the call goes to voice mail and the Busy greeting plays.

4. Test the message retrieve functionality by dialing the abbreviated dial number chosen to retrieve messages (refer to Section 5.9 Message Retrieval on page 9).

NOTE: Message waiting lamp setup is not described in this document; it is a separate *MITEL MAIL* application. The message lamp indicator must be lit on the set to allow use of the *SUPERSET* Message key or Call Sender of Oldest Message Features (described in Section 59.1 Message Retrieval Using a *SUPERSET,* and Section 5.9.2 Message Retrieval Using Feature Code).

7. CONSOLE AND REMOTE ACCESS TO MITEL MAIL

This procedure shows how to connect the console and the modem to the *MITEL MAIL* system.

7.1. Console Setup

The console uses a 9 to 25 pin NULL MODEM RS-232 cable, included with the system.

NOTE: You MUST use a NULL modem cable, or a straight-through cable with a NULL modem adapter, for console connection (see Figure 3 on page 33).

- Connect the 9-pin cable connector to COM1 (designated console in *MITEL MAIL* system software).
- Connect the 25-pin cable connector to the terminal.
- Set console to 9600 baud rate with 8 data bits, 1 stop bit, and no parity.

7.2. Remote Maintenance Access

To connect to the system via a Modem, use a straight-through 9 to 25 pin RS-232 cable between the *MITEL MA/L* COM1 port and the modem. Mitel recommends using an external US Robotics Sportster 14,400 Fax Modem.

NOTE: You MUST use a straight-through cable for modem connection. DO NOT use a NULL modem adapter. This cable differs from the one mentioned above, for the console (Figure 3).

- Connect the 9-pin cable connector to COM1 (designated console in *MITEL MAIL* system software).
- Connect the 25-pin cable connector to the modem port.
- For console and remote maintenance, A/B switch box can be used
- Remote terminal MUST be set to 1200 baud rate with 8 data bits, 1 stop bit, and no parity.
- Modem DIP switch setting for US Robotics Sportster 14,400 Fax Modem (external) is shown in Table 1.

Table 1. DIP Switch Setting on US Robotics Modem

	1	2	3	4	5	6	7	8
OFF		x	x		x	x		X
ON	X			X			X	

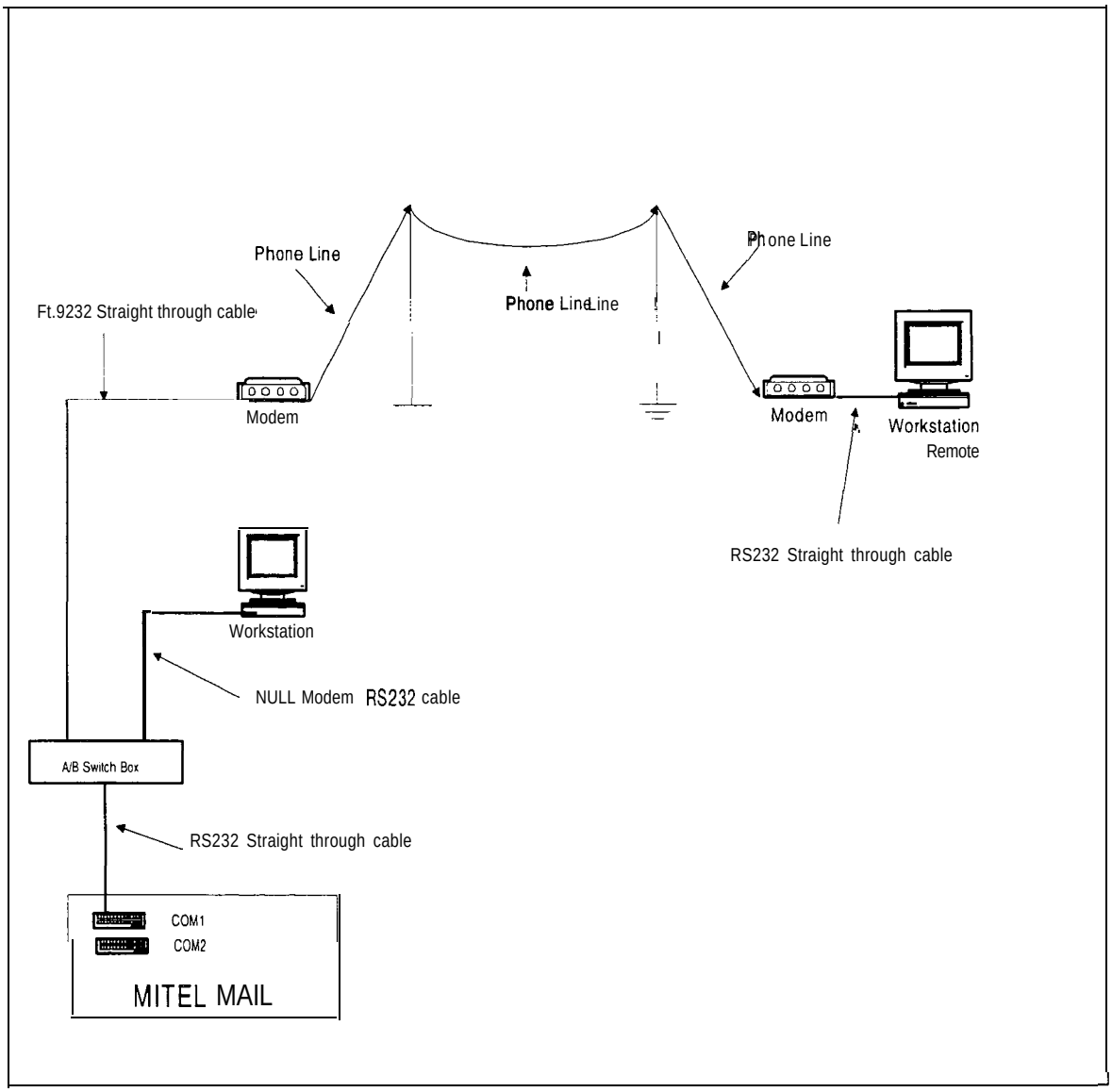


Figure 3- Console and Remote Maintenance Connection to MITEL MAIL

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MITEL MAIL™

Voice Processing Solutions 1

PBX Integration

SX-2000® PABX

MITEL®

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MITEL MAIL™ on the SX-2000® PABX

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OVERVIEW

This document is intended to show the necessary hardware connectivity to the MITEL SX-2000® PABX, as well as to define the Customer Data Entry (CDE) requirements to integrate the MITEL MAIL™ system with the PBX.

GENERAL

Full integration between the *MITEL MA/L* system and the *SX-2000* is achieved through the use of the "Enhanced In-band" signaling application on *MITEL* MAIL, and Advanced Analog Networking (AAN) on the *SX-2000* system. Enhancements are as follows:

- Conditional Greetings can be enabled to provide Busy, No-Answer and Not Available responses to callers forwarded to subscribers' mailboxes.
- During message playback, subscribers can answer messages left by other internal users. This only applies to internally forwarded calls.
- A single ARS access code can be used for direct subscriber login, call forwarding and call rerouting.

MITEL MAIL can be interfaced to the SX-2000 without using the Enhanced In-band signaling application, but is not discussed in this document. Mitel recommends the integration discussed in this document for ease in implementation, usability and increased functionality, using MS2007 MR2 (N11 .4.0) or greater. In older software loads, Enhanced In-band signaling can be used but is limited in functionality and complicated to implement.

REQUIREMENTS

- *M/TEL MA/L* includes "Receptionist II" and "Enhanced In-band" signaling as part of the basic package.

- PBX software MS2007 MR3 (N16.1.1) is required for the Digital E&M (T1 E&M) interface.

- Minimum software load of MS2007 MR2 (N11 .4.0) is required to support full functionality. The following feature packages must be purchased on the PBX, as required:

  - Advanced Analog Networking

    - Required on the Voice Mail PBX for Enhanced In-band signaling or Direct Subscriber Login.

      NOTE:

      1. Software load N1 1.4.0 (MR2) provides enhancements to AAN for ease in integrating to *M/TEL MAIL* for Enhanced In-band Signaling.

      2. AAN can only be used for message retrieval (not Forwarding) in software versions older than N11 .4.0.

  - Answer Plus - MCD

    - Required to make use of the System Reroute *timer* in station COS. The System Option timer is used otherwise. This timer is used only for 2nd *alternative rerouting.*

  - Flexible Dimensioning

    - If callback messages are applied from voice mail, the maximum number of SUPERSET™ *Callback Messages* should not exceed the limit controlled by the purchased dimension level (MFRD). This should be considered separately on remote PBXs in a Network.

      Consider the maximum number of multiline sets in each PBX and set to set messaging. The following multiline sets must be considered in this count: SUPERSET 4®, SUPERSET 4DN™ and all *SUPERSET 400* series sets.

      NOTE: *SUPER-SET Callback Messages* can be flexed in PBX software level MS2007 only.

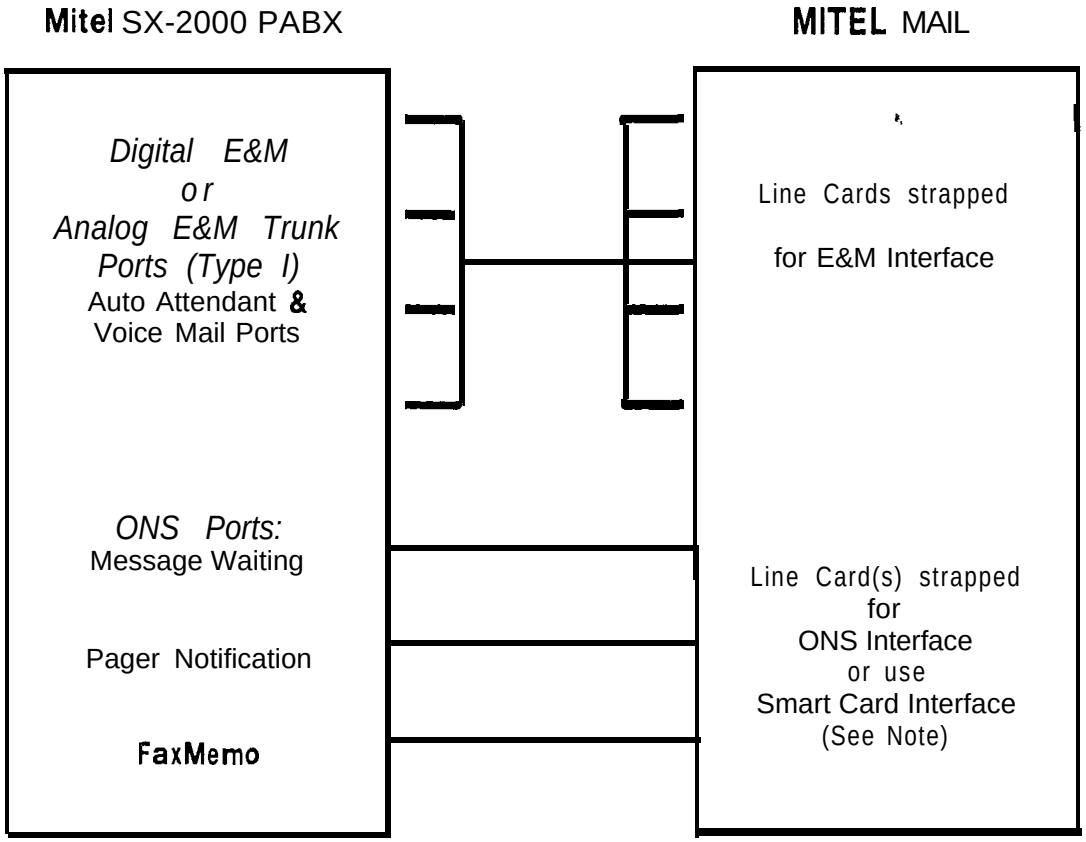
All Network PBXs require the following features for full use of Network voice mail - Callback functionality from a voice mail hunt group and public network access:

Public Network Access via DPNSS (if necessary)
MSDN/DPNSS Voice I
MSDN/DPNSS Voice III
MSDN/DPNSS Voice V

NOTE: Callback Messages from a voice mail hunt group is only available in MS2007.

HARDWARE INTERFACE

- The *MITEL* MAIL system interfaces to the SX-2000 family of PBXs via Type I ▪ E&M trunks (analog or digital) for call processing, and QNS port(s) for message activation/deactivation. See Notes below.
- Receptionist II and **VoiceMemo** functionality is performed on the same E&M trunk ports through the use of AAN and Enhanced in-band signaling.
- Pager Notification and **FaxMemo** require additional dedicated ONS port(s). E&M ports can be used, but this is not practical from a hardware real estate perspective.



NOTES:
- Please refer to *MITEL MA/L Volume 2, Reference and Configuration* for message waiting configuration.
- Pager Notification and FaxMemo cannot use the Smart Card Interface.
- Using the Smart Card for message waiting simply involves a data connection from a data port on the Smart Card (RS232) to a modem connected to an ONS port on the SX-2000. This port accesses the modem, goes off-hook and dials the message activate or deactivate access code on the PBX.
- Digital E&M Trunks (T1 E&M) may be used with MS2007 MR3 (N16.1 .1) when flash on Digital E&M is supported on the PBX software.

SX-2000 ICS PROGRAMMING

1. Feature Access Code Assignment

Call Hold - Retrieve	*11
Call Forwarding - Busy (External)	*62
Call Forwarding - Busy (Internal)	*63
Call Forwarding - Follow Me	*64
Call Forwarding - No-Answer (External)	*65
Call Forwarding - No-Answer (Internal)	*66
Message Waiting - Activate	*90
Message Waiting - Deactivate	*91

NOTE: These FACs are programmable and are referenced when programming the *MITEL MAIL* database (see page 13).

2. Class of Service

Subscriber's Extension

Call Forwarding (External Destination)	Yes	
Call Forward - No-Answer Timer (O-I 25 sec)	10	(15 is default - must be less than System Reroute and No-Answer Recall timers)
Multiline Set Callback Message Erasure	No	(optional - applies to the Voice Mail PBX only)

E&M Trunks

COV/ONS/E&M Voice Mail Port	Yes	
Public Network Access via DPNSS	Yes	(required on the Voice Mail PBX in a Network or Pager Notification through a Remote PBX)
Public Network to Public Network Connection Allowed	Yes	(required on the Voice Mail PBX if trunk to trunk connections are to be permitted)
No-Answer Recall Timer (O-45 s)	30	(17 is default - must be greater than call forward and system reroute timers)

ONS Ports

COV/ONS/E&M Voice Mail Port	Yes	
Message Waiting	Yes	
Permanent Do Not Disturb	Yes	(optional - MS2007 only)

All Other Incoming Trunks

No Answer Recall Timer (O-45 s)	30	(17 is default - must be greater than call forward and system reroute timers)

3. System Options Assignment

Call Rerouting Timer (5-60 s)	22	(default - must be greater than Call Forward No-Answer, and less than No-Answer Recall timers)
Ringing Cadence for Tie Line Calls (Internal/External)	Internal	(required if *MITEL MAIL* performs screened transfers)
Disable End of Dial Character (#) (Yes/No)	No	

4. **ONS/OPS** Circuit Descriptor Assignment

Default values can be assigned for the ONS voice mail ports which will be used for Messaging, Pager Notification or FaxMemo. Single line sets on the PBX, subscribing to voice mail and equipped with a message lamp, must include the following option:

Message Waiting Lamp (Yes/No)	Yes

5. Single Line Set Assignment

Assign directory numbers to the ONS voice mail ports and apply the proper Circuit Descriptor Number.

6. Station Service Assignment

Apply the proper Class of service (COS) number to the ONS voice mail ports. Toll fraud should be a consideration when assigning a COR to the voice mail ports. External dialing may be required for Pager Notification or Message Forwarding.

7. Hunt Group Assignment - (MS2007 Only)

Assign the ONS Messaging port(s) to a voice mail hunt group type with a Pilot Number that does not conflict with any other dial string in the PBX. Make the Hunt Mode "Circular" or "Terminal".

NOTE: Do NOT use single digit hunt group access codes.

8. Telephone Directory

Assign a name to the voice mail hunt group number so users can easily identify a callback message from *M/TEL MA/L.*

9. E&M Trunk Circuit Descriptor Assignment

Address Signaling	DTMF	
Incoming Start Type	IMM	
Disconnect Timer	300	(must be greater than the "Maximum Flash Timer")
Minimum Flash Timer (100-250 ms)	100	
Maximum Flash Timer (200-250 ms)	250	
Outgoing Start Type	IMM	
Fake Answer Supervision After Outpulsing	Yes	
Ignore Answer Supervision	Yes	
Release Supervision Expected	Yes	
Audio Inhibit Until Answer Supervision	No	
Transmission Facility (2 Wire/4 Wire)	2 Wire	

NOTE: The E&M trunks on the PBX must be strapped for Type I.

10. Trunk Service Assignment

Assign the E&M trunks the proper COS, COR and simply Absorb "0" as shown. A Trunk Label such as "VoiceMail" may be entered.

Non-Dial-In Trunks Answer Points			Dial-In-Trunks Incoming Digit Modification	
Day	Night 1	Night 2	Absorb	Insert
			0	

NOTE: Toll fraud must be considered when assigning a COR to the voice mail ports. External dialing may be required for Pager Notification or Message Forwarding.

11. Program the E&M trunks in the Trunk Assignment and apply the proper Trunk Service Number and Circuit Descriptor. The trunks are then entered in the Trunk Group Assignment, using Circular or Terminal hunting.

12. Program the following in the Automatic Route Selection Forms:

Digit Modification Assignment

Number of Digits to Absorb	Digits to be Inserted	
2	<R>#<F>#<E>#	(Require AAN, MS2007 R2/N11.4.0 on the PBX and Enhanced In-band signaling on *MITEL MAIL)*

NOTE:
- A Tone Plan may have to be implemented at the beginning of the "Digits to be Inserted" field, to pause before digits are outpulsed to *MITEL MAIL.* Do NOT use a tone plan when using Enhanced In-band signaling.
- <R> is the Call Forward Reason, as programmed in the FACs.
  <F> is the Call Forwarding party.
  <E> is the source party.
  # is simply a delimiter used in the Enhanced In-band Templates.
- The digits outpulsed to *M/TEL MAIL* must match specific templates for Enhanced In-band Signaling to work.

Program the Route Assignment, referencing the proper Trunk Group and Digit Modification Number. Digits Before Outpulsing can be set to eliminate overlap outpulsing, but should not be required.

Automatic Route Selection Assignment

Leading Digits: 81
Second Dial Tone: No — COR Group Number:

Digits Dialed	Digits to Follow	Type	Number
	0	Route	01

NOTE: All access to *MITEL MAIL* will follow this single ARS entry.

13. System Speed Call Assignment

Program a system speed call number which contains the ARS access to the *MITEL MAIL* E&M ports.

14. Call Rerouting

Assign the associated speed call number for *M/TEL MA/L* access in the following forms, as required:

- Call Rerouting Always Alternative Assignment
- Call Rerouting First Alternative Assignment
- Call Rerouting Second Alternative Assignment

Extensions can be rerouted to *M/TEL MA/L* in the Call Rerouting Assignment. All extensions may reference a single Call Rerouting Alternative Assignment. Alternatively, users may program call forwarding to the ARS access to *M/TEL MAIL.*

The voice mail hunt group for messaging must be Call Rerouted Always to the E&M ports.

MITEL MAIL HARDWARE

Strap the line card ports for E&M and ONS as required. The Smart Card may alternatively be used for Message Waiting.

MITEL MAIL PROGRAMMING

The *MITEL MAIL* system must be programmed to integrate to the SX-2000 for proper call handling. The following programming details are to assist you in setting up Templates for the Enhanced In-band signaling application. For other basic programming, such as Message Waiting, refer to *M/TEL MA/L Volume 2, Reference and Configuration.*

Define Line Group in Offline Menu

1. Enter G to select the Offline Menu, from the VoiceMemo Configuration - Main Menu.

   ⇒ Enter B to Duplicate Active Configuration.
   The system copies the active configuration into the inactive work area.

2. Enter G to Define Line Groups and Fax Groups.

3. Enter G to select Current Group.
   ⇒ Enter the number for the line group to configure.

4. Enter N to enter the Name for this group: Enhanced in-band.

5. Enter A to Add lines to this group.
   ⇒ Enter triplet identifiers (Module:Slot:Circuit).

6. Enter T to show this group and confirm the lines you added.

7. Enter X to Exit this menu and return to the Offline Menu.

8. Enter A to select the Line Group Only Applications menu.

9. Enter E to select the Enhanced In-band application for this line group.
   The system displays the following:

```
INBAND Integration
------------------
(A) Calling Extension Absorbed Digits (0-12) = []
(B) Calling Extension Signed Offset (+/-n) = []
(C) Called Extension Absorbed Digits (0-12) = []
(D) Called Extension Signed Offset (+/-n) = []
(E) MF Enable? (Y/N) = []
(X) Exit
```

   ⇒ Do NOT change any of these parameters,

10. Enter X to Exit and save changes.
    The system writes the changes to the offline configuration and returns to the VoiceMemo Configuration - Main Menu.

⇒ Remember to Activate Configuration to enable changes.

Configure the Enhanced In-Band Application

1. Access the Online Menu (enter G from the VoiceMemo Configuration - Main Menu) to modify the inactive configuration.
   The system displays the following:

```
Group #1 Lines = [Name]
Voicememo Configuration - Online Menu
-------------------------------------
(G) Group Selected = [1]
(M) Modify Application
(C) Report Current Configuration
(Q) Quit - Forget Changes
(X) Exit - Save Changes
```

2. Enter G to select your group.
   ⇒ Enter the number of the Enhanced In-band line group.

3. Enter M to Modify Application. The system displays:

```
Enhanced In-Band
---------------------------
(A) Configure Application
(B) Other Features
(X) Exit
```

4. Enter A to select Configure Application. The system displays the Enhanced In-band menu:

```
Enhanced In-Band
---------------------------
Date Installed: XXXXXXXX
Dated Modified: XXXXXXXX
(N) Application Name = []
(D) Application Description = []
(T) Edit Template Menu
(P) Edit Parameters Menu
(0) Show Applications
(I) Install Application
(L) List Applications
(S) Other Features
(X) Exit
```

5. Enter N to name the application. The Application Name is used to install the integration; it is case sensitive.

   ⇒ Enter Mitel.

6. Enter D to select Application Description.

   ⇒ Enter **Mitel** Enhanced Integration.

   Templates are used to match codes sent by the PBX.

7. Enter T to access the Edit Template Menu.
The system displays the following:

```
IN-BAND Edit Template Menu
--------------------------------------------
(M) Modify Template = [ ]
(D) Data = [ ]
(A) Action = [ ]
(T) Timeout = [ ]
(E) Error Action = [ ]
(N) Next Template = [ ]
(C) Comment = [ ]
(X) Exit
```

8. Enter M and enter the Template Number to modify.

⇒ Enter the template information as shown in the following example. Template Data will vary from site to site, depending on Feature Access Codes used in the SX-2000.

⇒ Press Enter to expand the template menu for each template. Press Enter to re-display each template and verify your entries.

Enter Template information, as in the following Example:

Template 1
Data = R
Action = T
Timeout =
Error Action =
Next Templates = 2 3 4 5 6 7 8 9
Comment = Incoming Seizure

Template 2
Data = *62#dx#sx# (*62 - programmed FAC for Call Forward Busy External)
Action = V4
Timeout = 10
Error Action = H
Next Templates =
Comments = CFB External

Template 3
Data = I 63#dx#sx# (*63 - programmed FAC for Call Forward Busy Internal)
Action = V4
Timeout = 10
Error Action = H
Next Templates =
Comments = CFB Internal

Template 4
Data = *65#dx#sx# (*65 - programmed FAC for Call Forward No Answer External)
Action = V3
Timeout = 10
Error Action = H
Next Templates =
Comments = CFNA External

Template 5
Data = *66#dx#sx# (*66 - programmed FAC for Call Forward No Answer Internal)
Action = V3
Timeout = 10
Error Action = H
Next Templates =
Comments = CFNA Internal

Template 6
Data = *64#2150#sx# (*64 - programmed FAC for Call Forward Always)
Action = V1 (2150 - Voice Mail Hunt Group for Messaging)
Timeout = 10
Error Action = H
Next Templates = 8
Comments = Callback Login

Template 7
Data = ##sx#
Action = V1
Timeout = 10
Error Action = H
Next Templates =
Comments = Local Login

Template 8
Data = *64#dx#sx# (*64 - Programmed FAC for Call Forward Always)
Action = V2
Timeout = 10
Error Action = H
Next Templates =
Comments = CFA

Template 9
Data = ###
Action = V5
Timeout = 10
Error Action = H
Next Templates =
Comments = Auto Att - VM

9. After defining the templates, enter X to Exit and return to the Enhanced In-band menu.

10. Enter 0 to Show Application. Ensure that all Templates are set up correctly.

Install the Enhanced In-Band Application

1. Enter I to Install Application, from the Enhanced In-band menu.

   ⇒ Enter the Application Name. This name is case sensitive and must be entered exactly as it appears in the Application Name field (refer to page 12).

2. Enter S to save the application.

3. Enter X to Exit and save changes.

4. Make any other necessary program changes.

5. Activate the inactive configuration.

6. Run a Configuration Report to confirm programming.

NOTE: This will result in service outage.

The following reports provide example configurations for Enhanced */n-band Signaling* and ONS Message *Waiting*. Key areas that should also be programmed for initial setup, in the Online Menu, are highlighted in bold text.

SYSTEM CONFIGURATION
November, 1995 8:30 am

Group **#1: "Mitel** Enhanced Integration"
[lines **0A,0B,1A,1** B]
Application = [ENHANCED IN-BAND]
Dial plan = [4,4,4,4,4,4,4,0,A]
Administrator mbox # = [6668]
General Greeting mbox # = []
Attendant mbox # = [6669]
Wait Prompt = [Y]
Caller multiple messages enabled = [Y]
KEY-O for attendant transfer during greeting = [y]
Disconnect string = []
Pre-company name string = []
Pre-mailbox greeting string = []
Passcode Length Min = [4], Max = [10], Language = [E]
Start of day = [08:00 AM], End of day = [05:00 PM], Days of Week = [DDDDDNN]
Passcode trip count = [5], Passcode trip period = [24]
Dial-by-name: Last First = [Y], Match Threshold = [3], Exact = [Y]
Suppress Number = [N], Single Digit Access = [y]
Delay Before Answer = **[30]** (For Screened calls only)
E-mail Transfer String = []
Allow Dial an Extension for callers = [y], users = [y]
Analog Networking: Call Setup timeout = [6]
International Access Code = [], Country code = []
Area/City code = [], 1 plus dialing = []
Area/City code is dialed with Local Telephone Number = [N]
Telephone number = [], Loop-back Test Mailbox = []
Receptionist Enabled = [Y]
Pre-DN = **[S+],** Post-DN = **[+H],** Connect = **[],** Serial = **[S+]** (Blind Transfer)
Return = [S+*ll], Return call reject = **[S+*11],** Reorder Action = [S+*ll] (Call Hold Retrieve)
PBX dial plan = [4,4,4,4,4,4,4,0,a]
Offsets = [0,0,0,0,0,0,0,0,0,0]
Deleted digits = [0,0,0,0,0,0,0,0,0,0]
Time-out for receipt of first DTMF digit (.l seconds) = [0]
Greet/Name = [G], PBX console operation = [N]
Day operator = [OH], Night operator = [2215H]
Attendant extension = [2202H]
Attendant's extension = [2202H]

NAME: **MitelSX-2000**
DESCRIPTION: **Mitel** Enhanced Integration
Installation Date: 16-May-95 3:35:02 pm
Last Modify Date: 21-Sep-95 4:14:55 pm
T1: R, T, ,
Next:23456789
Comment: Incoming Seizure

T2: | 62#dx#sx#, V4, 10, H
Next:
Comment: CFB External

T3: *63#dx#sx#, V4, 10, H
Next:
Comment: CFB Internal

T4: *65#dx#sx#, V3, 10, H
Next:
Comment: CFNA External

T5: *66#dx#sx#, V3, 10, H
Next:
Comment: CFNA internal

T6: *64#2150#sx#, V1, 10, H
Next: 8
Comment: Callback Login

T7: ##sx#, V1, 10, H
Next:
Comment: Local Login

T8: | 64#dx#sx#, V2, 10, H
Next:
Comment: CFA

T9: ###, V5, 10, H
Next:
Comment: Auto Att - VM

Group **#2:** "ONS MESS WAIT"
[lines 2A]
Application = [DTMF TO PBX DIALER]
Initiai Dialtone Detect = [Y]
Access dial string = [], Dial tone confirmation = []
Pre-DN ON dial string = [***90**], Pre-DN OFF dial string = [***91**] (FACs for Message Act/Deact)
Post-DN ON dial string = [**#**], Post-DN OFF dial string = [#](Enable End of Dial # in System
Suppress message light updates = [**Y**], Wait for dial tone = [N] Options)
Alternate Code = []

⇒ Phone Line Exceptions

Flash Hook Timer change required:
Exception Number 23: Set to 20 for all Enhanced In-Band Lines, as shown below:

Host 1:1 Line 1 configuration:
23 Flash hook time 20 .OI sec

Host 1:2 Line 2 configuration:
23 Flash hook time 2 0 .01 sec

Host 1:3 Line 3 configuration:
23 Flash hook time 2 0 .01 sec

Host 1:4 Line 4 configuration:
23 Flash hook time 20 .OI sec

⇒ FCOS

Conditional greetings can be used by enabling FCOS 161: Conditional Greetings. When this FCOS is set; mailboxes must be initialized before these conditional greetings can be recorded.

MESSAGE WAITING CONSIDERATIONS

1. Message waiting indications activated from an ONS voice mail port with Class of service option "COV/ONS/E&M Voice Mail Port" ENABLED, and in a voice mail hunt group type, can ONLY be deactivated from a port (with this COS option ENABLED) within the same voice mail hunt group. These are "call me back" (callback) messages, which are readable from a display set.

   NOTE: This applies to PBX software level MS2007 only.

2. The maximum number of call me back messages permitted on any one PBX is controlled by the purchased dimension (MFRD) level.

3. Message waiting indications activated from an ONS voice mail port with Class of service option "COV/ONS/E&M Voice Mail Port" DISABLED, can be deactivated from any port with this COS option DISABLED. These are "Dialed Message Waiting" messages, which are only lamp indicators on all sets.

4. "Call me back" and "Dialed Message Waiting" indications are retained after a main control activity switch (reload or restart) occurs. This is true-for software loads MS2005 (L08.1) and above. Prior to this, these messages were not retained, making it necessary for the voice mail system to reactivate messages.

5. Class of service option "Message Deactivate on-off hook" does not apply to Callback Messages activated by the ONS voice mail port(s).

   NOTE: This applies to MS2004/1(K04.7E) and above only.

6. Attendant consoles are unable to receive a Message Waiting indication. This includes the SUPERSET 7®, SUPERSET 7DN™, SUPERSET 700™, SUPERCONSOLE 1000® and SUPERSET 7000™.

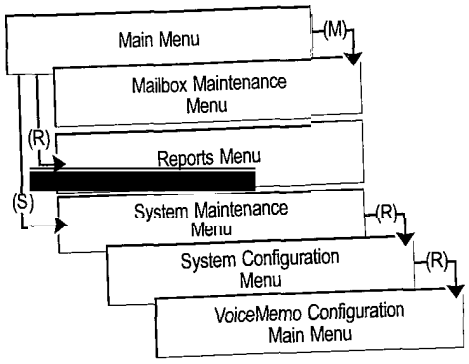
7. Analog SUPERSET 3™ Telephones and Single Line Telephones without Message Waiting lamps require "Message Waiting Audible Tone Notification" Class of service option enabled.

8. Subscribers with several voice messages in their mailboxes will have only one "call me back" or "Dialed Message Waiting" applied to their sets.

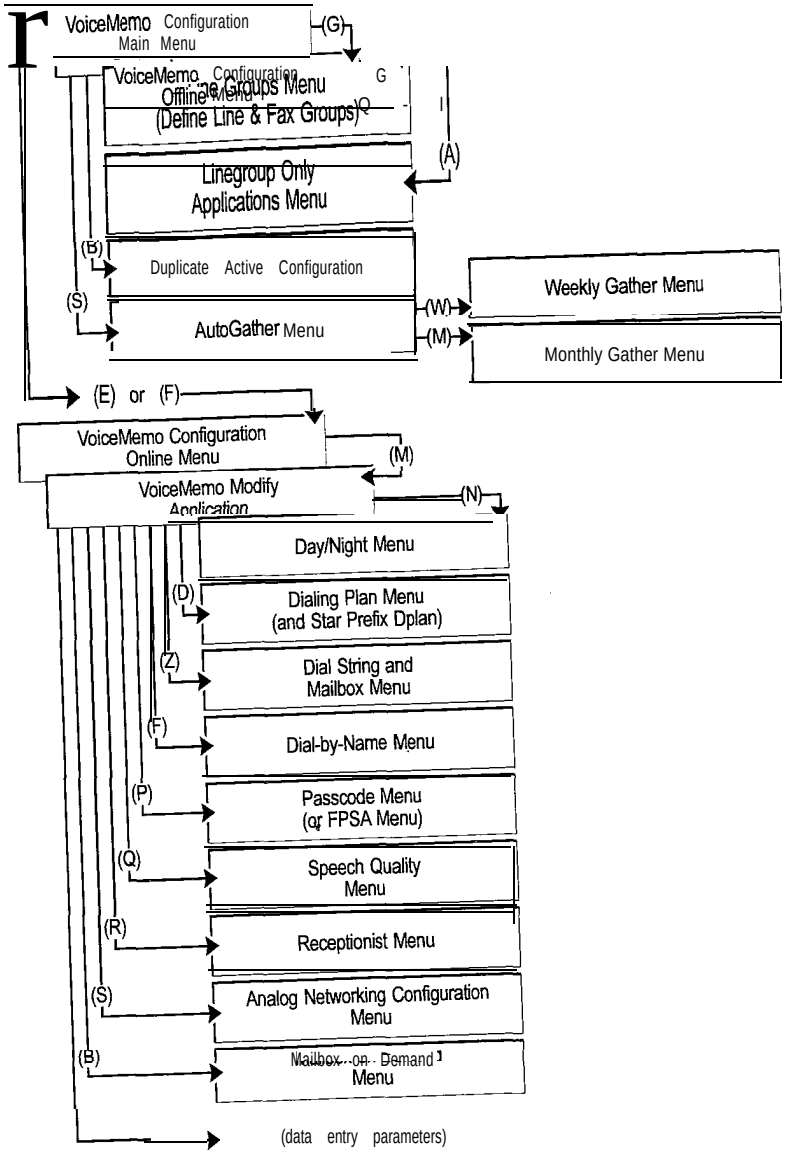
9. Advisory messages displayed on Analog *SUPERSET* 4 telephones take priority over the Message Waiting count displayed on the sets.

10. Messages can be activated from E&M (analog or digital) ports. However, these will only be "Dialed Message Waiting" indications (lamp only). Mitel recommends the use of ONS ports for call me back functionality.

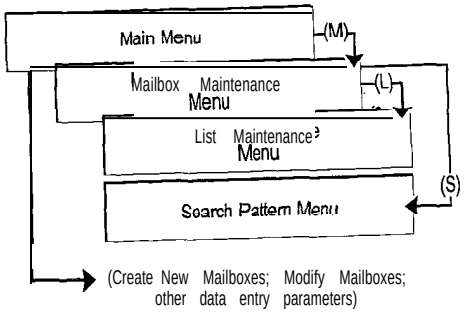
1 VoiceMemo Configuration Main Menu



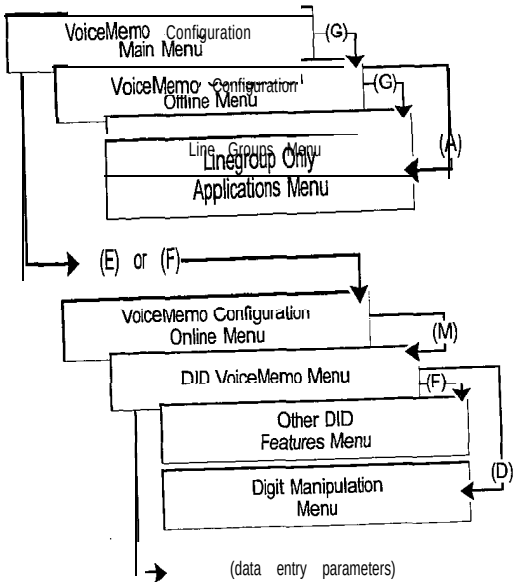
2 VoiceMemo Application



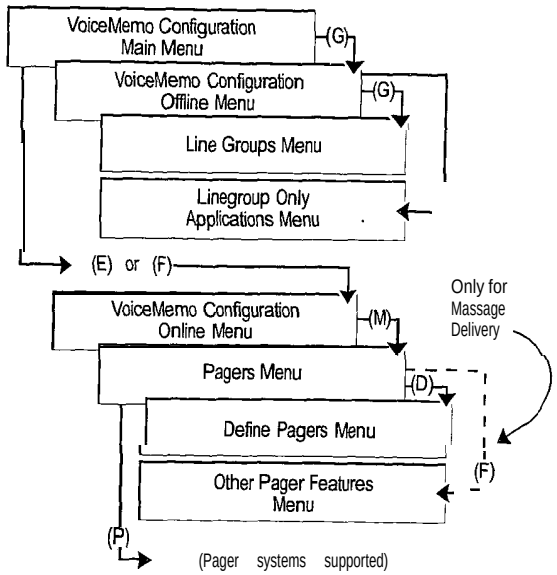
3 Mailboxes



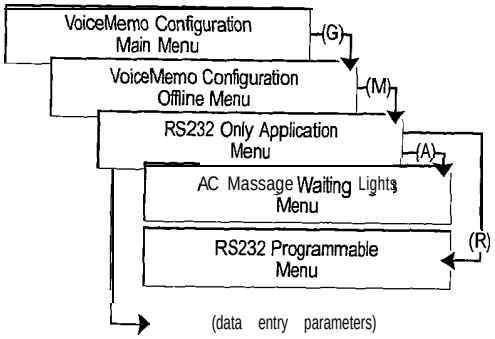
4 DID VoiceMemo Application



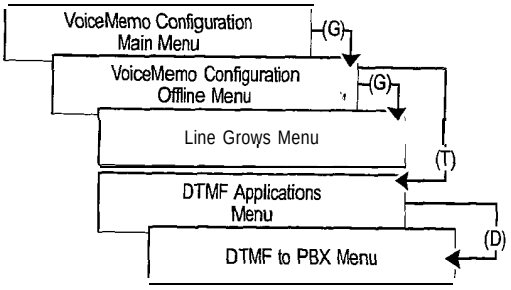
5 Pager Application



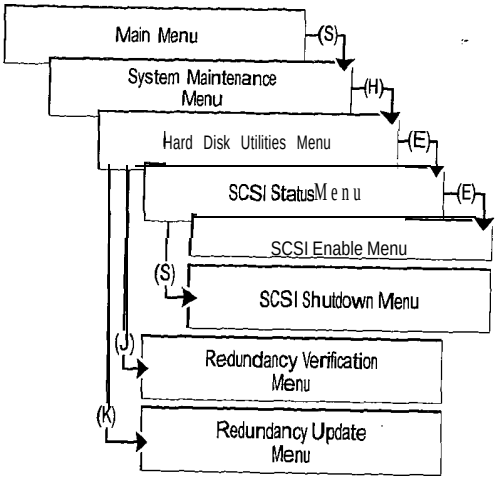
6 M-232 Message Lights Application



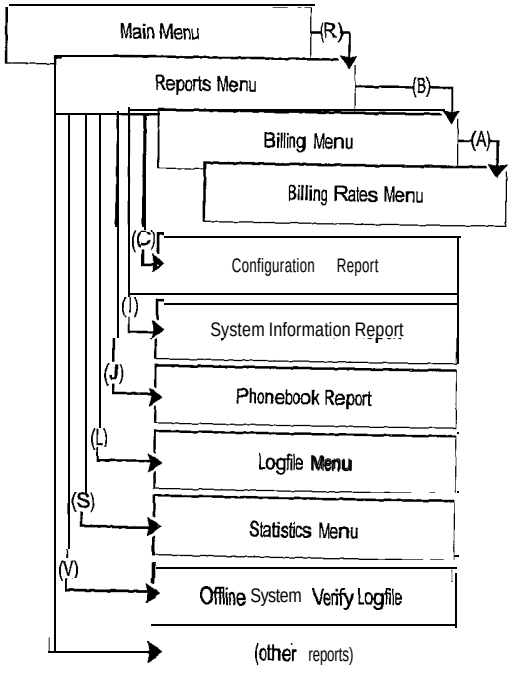
7 DTMF-to-PBX Message lights Application



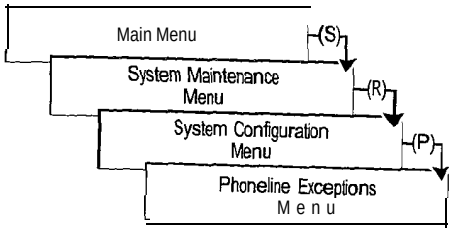
8 Hard Disk Utilities



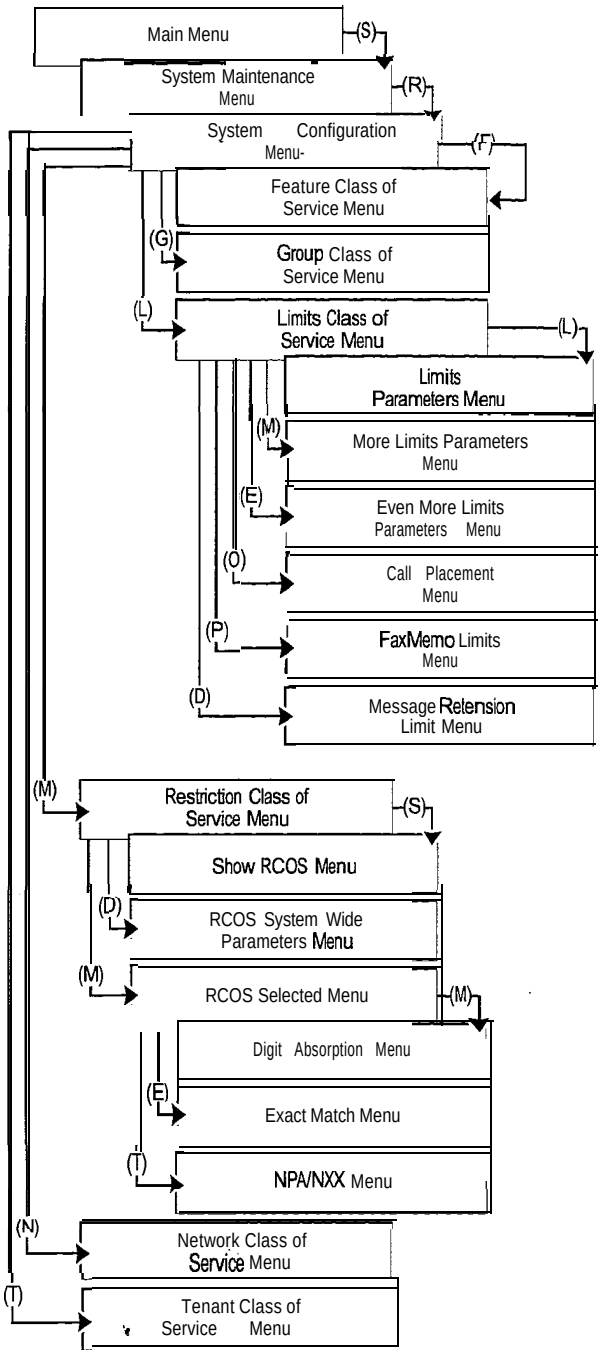
a Billing & Reports



10 Phoneline Exceptions



11 FCOS, GCOS, LCOS, RCOS, NCOS and TCOS



12 System Maintenance

